

Figure 51. Integrated Wildlife Habitat Ranking System-Henscratch

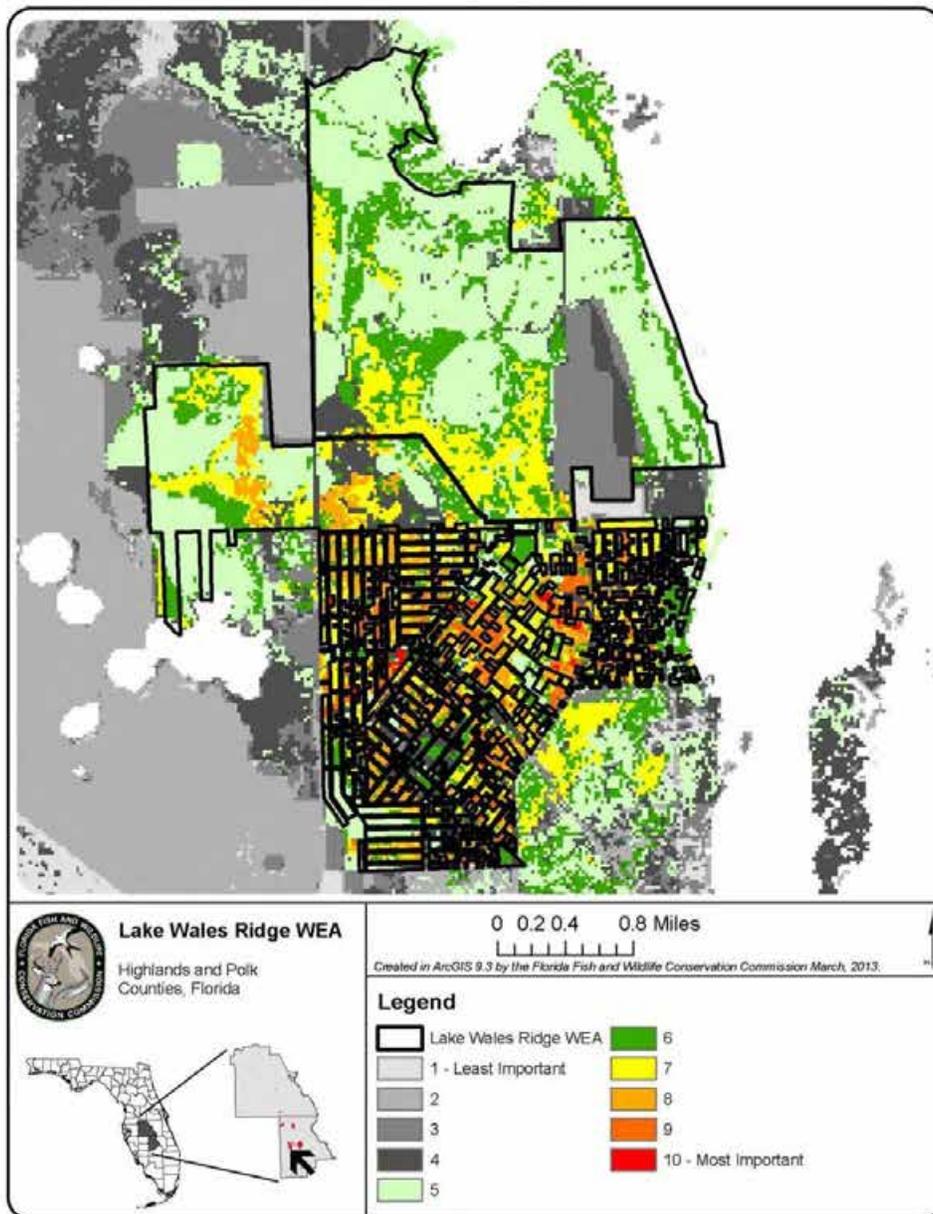


Figure 52. Integrated Wildlife Habitat Ranking System-Royce Unit Tract

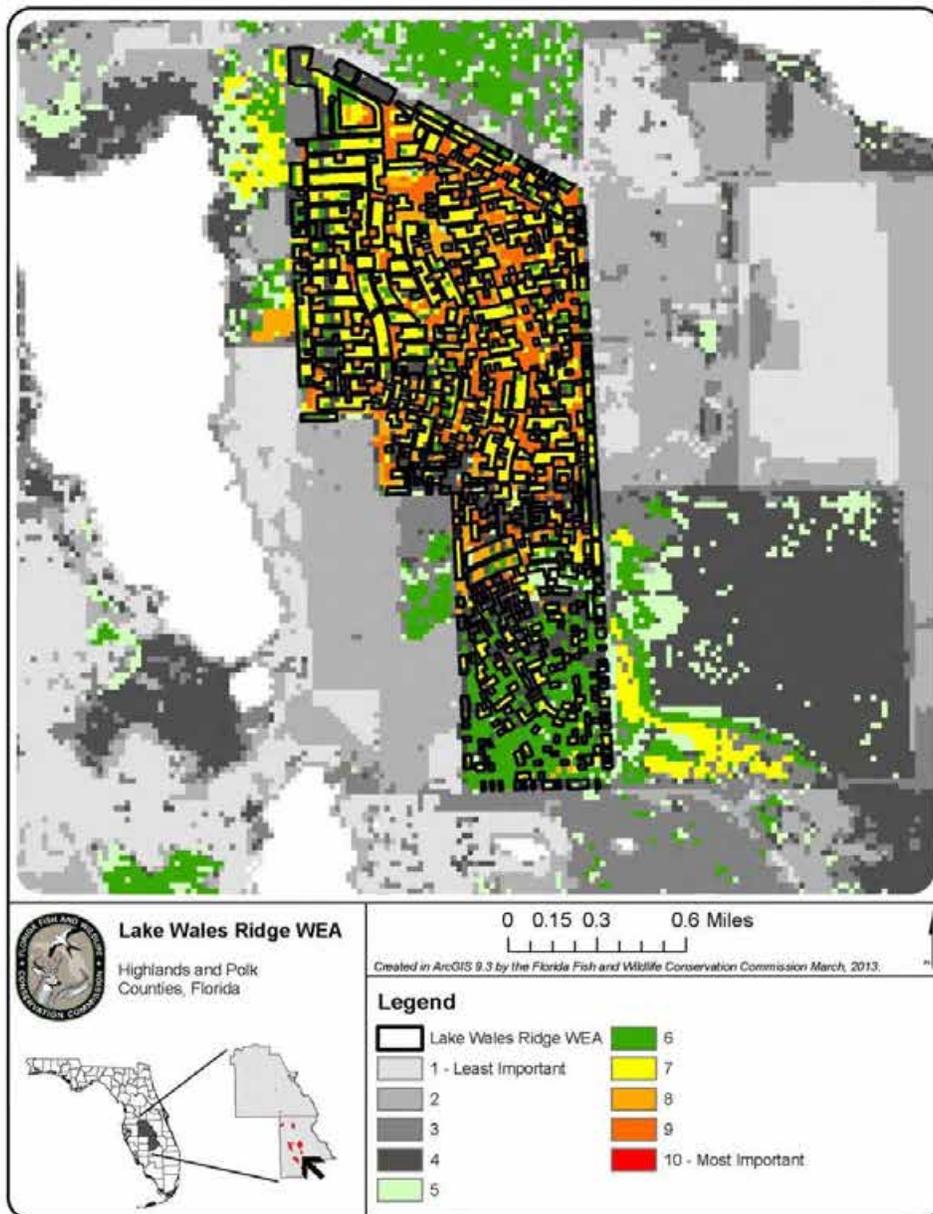


Figure 53. Integrated Wildlife Habitat Ranking System-Holmes Tract

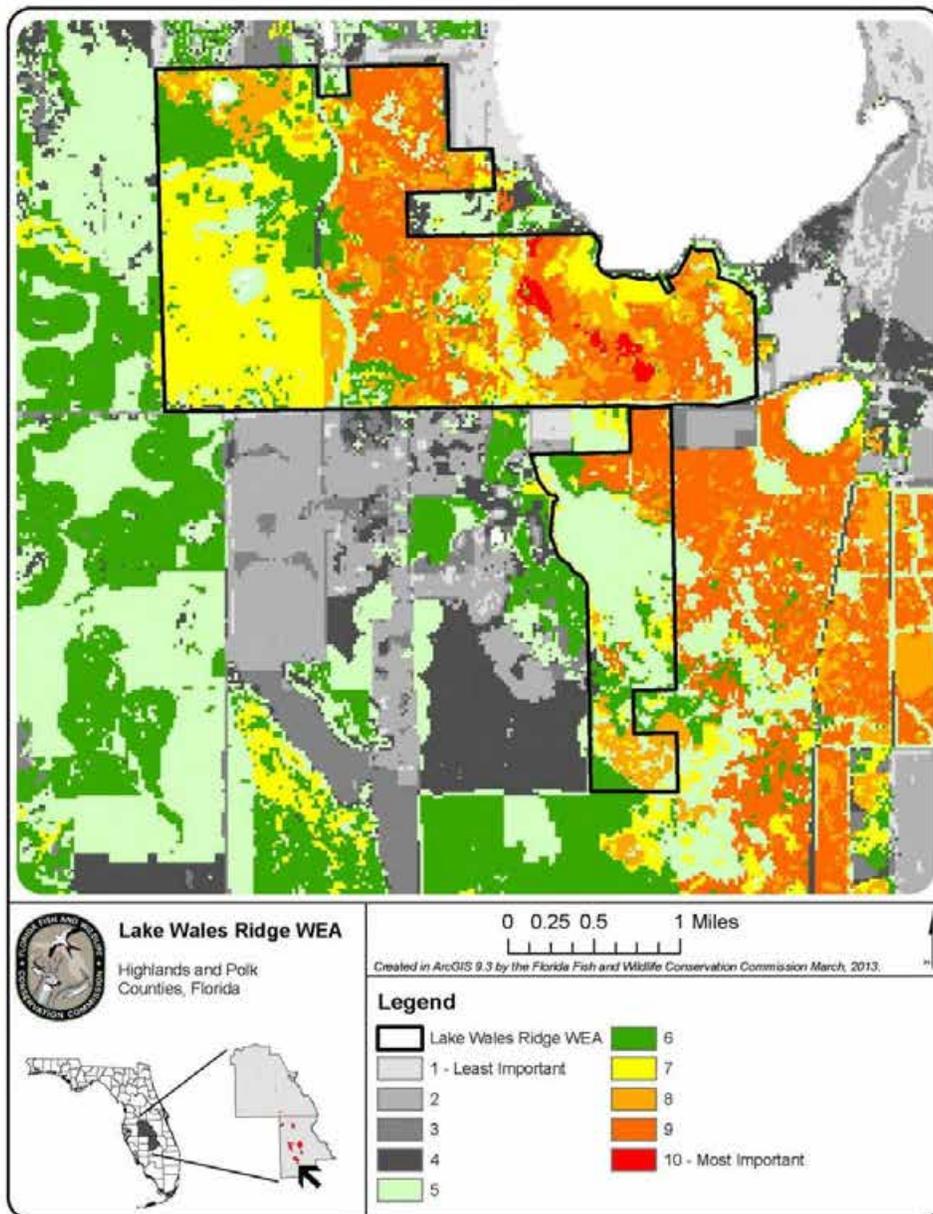


Figure 54. Integrated Wildlife Habitat Ranking System-Lake Placid Scrub/McJunkin

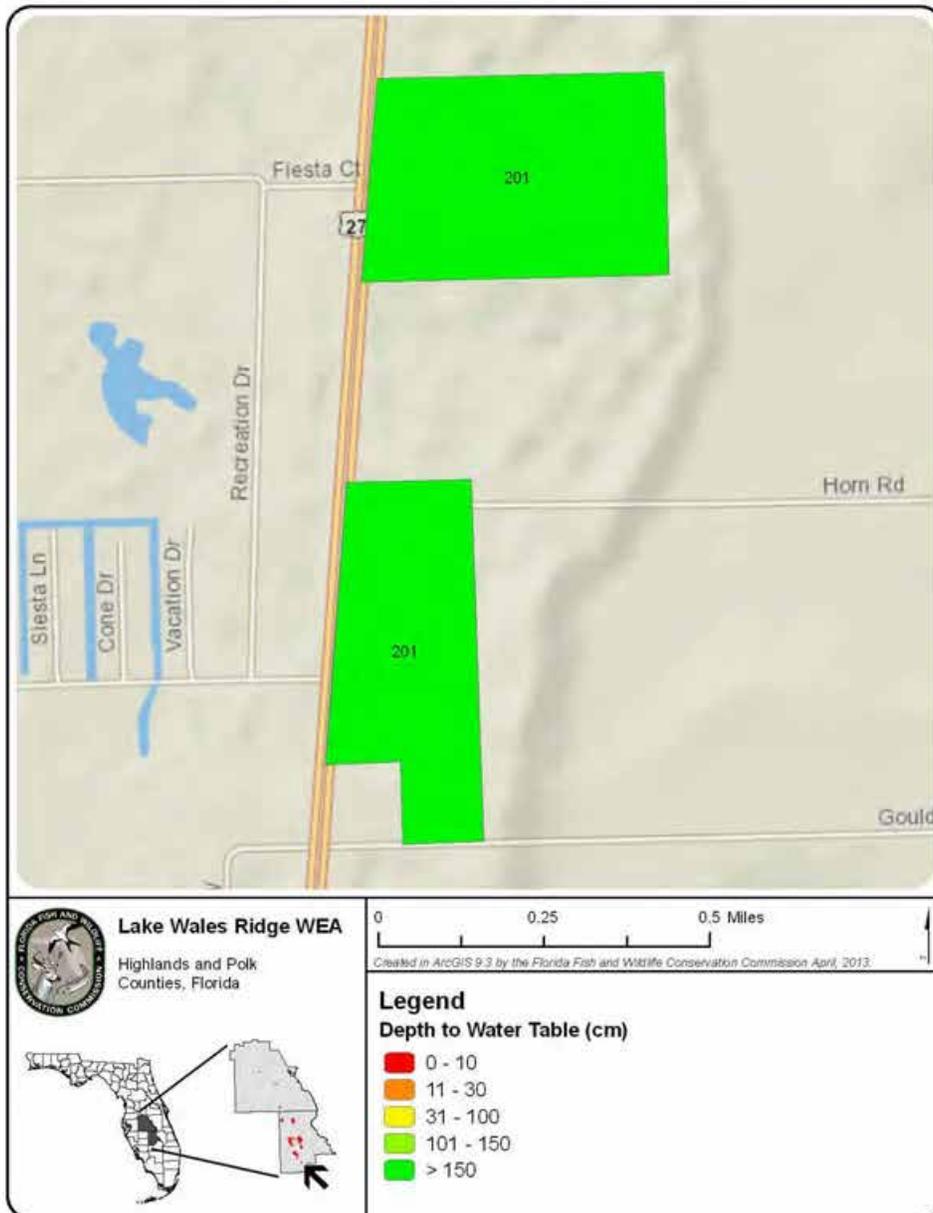


Figure 55. Integrated Wildlife Habitat Ranking System-Gould Road Tract

13.3 Soil Series Descriptions

Map Unit Description

Highlands County, Florida

[Minor map unit components are excluded from this report]

Map unit: 1 - Paola sand, 0 to 8 percent slopes

Component: Paola (82%)

The Paola component makes up 82 percent of the map unit. Slopes are 0 to 8 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 2 - St. Lucie sand, 0 to 8 percent slopes

Component: St. Lucie (85%)

The St. Lucie component makes up 85 percent of the map unit. Slopes are 0 to 8 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 3 - Basinger fine sand, depressional

Component: Basinger, depressional (80%)

The Basinger, depressional component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 7v. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 4 - Duette sand, 0 to 5 percent slopes

Component: Duette (80%)

The Duette component makes up 80 percent of the map unit. Slopes are 0 to 5 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 60 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 5 - Daytona sand, 0 to 5 percent slopes

Component: Daytona (77%)

The Daytona component makes up 77 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 51 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.



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Map Unit Description

Highlands County, Florida

Map unit: 6 - Tavares sand, 0 to 5 percent slopes

Component: Tavares (85%)

The Tavares component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 7 - Placid fine sand, depressional

Component: Placid, depressional (87%)

The Placid, depressional component makes up 87 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 8 - Immokalee sand

Component: Immokalee (87%)

The Immokalee component makes up 87 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 9 - Astatula sand, 0 to 8 percent slopes

Component: Astatula (80%)

The Astatula component makes up 80 percent of the map unit. Slopes are 0 to 8 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 10 - Myakka fine sand

Component: Myakka (77%)

The Myakka component makes up 77 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.



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Map Unit Description

Highlands County, Florida

Map unit: 11 - Orsino sand, 0 to 5 percent slopes

Component: Orsino (82%)

The Orsino component makes up 82 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 54 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 12 - Basinger fine sand

Component: Basinger (82%)

The Basinger component makes up 82 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 14 - Satellite sand

Component: Satellite (85%)

The Satellite component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 27 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 20 - Samsula muck

Component: Samsula (87%)

The Samsula component makes up 87 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 60 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 21 - Hontoon muck

Component: Hontoon (85%)

The Hontoon component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 80 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.



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Map Unit Description

Highlands County, Florida

Map unit: 22 - Brighton muck

Component: Brighton (92%)

The Brighton component makes up 92 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of woody organic material. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 75 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 28 - Archbold sand, 0 to 5 percent slopes

Component: Archbold (87%)

The Archbold component makes up 87 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 29 - Pomona sand

Component: Pomona (65%)

The Pomona component makes up 65 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 32 - Arents, very steep

Component: Arents (100%)

The Arents component makes up 100 percent of the map unit. Slopes are 45 to 65 percent. This component is on fills, rises on marine terraces on coastal plains. The parent material consists of altered marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 33 - Basinger, St. Johns, and Placid soils

Component: Basinger (30%)

The Basinger component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on seeps on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.



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Map Unit Description

Highlands County, Florida

Map unit: 33 - Basinger, St. Johns, and Placid soils

Component: Placid (30%)

The Placid component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on seeps on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is occasionally ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: St. Johns (30%)

The St. Johns component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on seeps on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 35 - Sanibel muck

Component: Sanibel (77%)

The Sanibel component makes up 77 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of thin organic material over sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 35 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 36 - Pomello sand, 0 to 5 percent slopes

Component: Pomello (87%)

The Pomello component makes up 87 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 39 - Smyrna sand

Component: Smyrna (85%)

The Smyrna component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.



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Map Unit Description

Highlands County, Florida

Map unit: 41 - Anclote-Basinger fine sand, frequently flooded

Component: Anclote (52%)

The Anclote component makes up 52 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 6w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Basinger, frequently flooded (30%)

The Basinger, frequently flooded component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 99 - Water

Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.



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Map Unit Description

Polk County, Florida

Map unit: 3 - Candler sand, 0 to 5 percent slopes

Component: Candler (85%)

The Candler component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on knolls on marine terraces on coastal plains, ridges on marine terraces on coastal plains. The parent material consists of eolian deposits and/or sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R154XY002FL Longleaf Pine-Turkey Oak Hills ecological site. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 7 - Pomona fine sand

Component: Pomona, non-hydric (70%)

The Pomona, non-hydric component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R154XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Pomona, hydric (20%)

The Pomona, hydric component makes up 20 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R154XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 13 - Samsula muck

Component: Samsula (80%)

The Samsula component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 60 percent. This component is in the R154XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 15 - Tavares fine sand, 0 to 5 percent slopes

Component: Tavares (85%)

The Tavares component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on knolls on marine terraces on coastal plains, ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 1 percent. This component is in the R154XY002FL Longleaf Pine-Turkey Oak Hills ecological site. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.



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Map Unit Description

Polk County, Florida

Map unit: 16 - Urban land

Component: Urban land (85%)

Generated brief soil descriptions are created for major soil components. The Urban land is a miscellaneous area.

Map unit: 17 - Smyrna and Myakka fine sands

Component: Myakka (40%)

The Myakka component makes up 40 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 4 percent. This component is in the R154XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Smyrna, non-hydric (40%)

The Smyrna, non-hydric component makes up 40 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 3 percent. This component is in the R154XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Smyrna, hydric (15%)

The Smyrna, hydric component makes up 15 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 3 percent. This component is in the R154XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 21 - Immokalee sand

Component: Immokalee, non-hydric (75%)

The Immokalee, non-hydric component makes up 75 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R154XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Immokalee, hydric (10%)

The Immokalee, hydric component makes up 10 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces, coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R154XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.



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Map Unit Description

Polk County, Florida

Map unit: 22 - Pomello fine sand

Component: Pomello (80%)

The Pomello component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on ridges on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 inches during July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. This component is in the R154XY001FL Sand Pine Scrub ecological site. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 26 - Lochloosa fine sand

Component: Lochloosa (90%)

The Lochloosa component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on marine terraces on coastal plains, flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 45 inches during July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. This component is in the R154XY008FL Upland Hardwood Hammocks ecological site. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 30 - Pompano fine sand

Component: Pompano (85%)

The Pompano component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains, drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 3 percent. This component is in the R154XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 31 - Adamsville fine sand

Component: Adamsville (85%)

The Adamsville component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on ridges on marine terraces on coastal plains, rises on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. This component is in the R154XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 36 - Basinger mucky fine sand, depressionial

Component: Basinger, depressionial (85%)

The Basinger, depressionial component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, June, July, August, September, October, November.



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Map Unit Description

Polk County, Florida

Map unit: 36 - Basinger mucky fine sand, depressional

Component: Basinger, depressional (85%)

December. Organic matter content in the surface horizon is about 14 percent. This component is in the R154XYD10FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 50 - Candler-Urban land complex, 0 to 5 percent slopes

Component: Candler (55%)

The Candler component makes up 55 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian deposits and/or sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Urban land (45%)

Generated brief soil descriptions are created for major soil components. The Urban land is a miscellaneous area.

Map unit: 54 - Pomello-Urban land complex

Component: Pomello (55%)

The Pomello component makes up 55 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 inches during July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Urban land (30%)

Generated brief soil descriptions are created for major soil components. The Urban land is a miscellaneous area.

Map unit: 58 - Udorthents, excavated

Component: Udorthents, excavated (100%)

The Udorthents, excavated component makes up 100 percent of the map unit. Slopes are 1 to 4 percent. This component is on fills on marine terraces on coastal plains. The parent material consists of altered marine deposits. Depth to a root restrictive layer is greater than 60 inches. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Nonirrigated land capability classification is 8e. This soil does not meet hydric criteria.

Map unit: 63 - Tavares-Urban land complex

Component: Tavares (75%)

The Tavares component makes up 75 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is

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Map Unit Description

Polk County, Florida

Map unit: 63 - Tavares-Urban land complex

Component: Tavares (75%)

about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Urban land (25%)

Generated brief soil descriptions are created for major soil components. The Urban land is a miscellaneous area.

Map unit: 68 - Arents, 0 to 5 percent slopes

Component: Arents (100%)

The Arents component makes up 100 percent of the map unit. Slopes are 2 to 5 percent. This component is on rises on marine terraces on coastal plains, fills. The parent material consists of altered marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 36 inches during January, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 1 percent. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 77 - Satellite sand

Component: Satellite (90%)

The Satellite component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on knolls on marine terraces on coastal plains, ridges on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 27 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. This component is in the R154XY001FL Sand Pine Scrub ecological site. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 83 - Archbold sand, 0 to 5 percent slopes

Component: Archbold (90%)

The Archbold component makes up 90 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. This component is in the R154XY001FL Sand Pine Scrub ecological site. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 99 - Water

Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.



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Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.



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13.4 FNAI Data Usage Letter



1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
www.fnai.org

April 11, 2014

David Alden
Land Conservation & Planning
Florida Fish and Wildlife Conservation Commission
Tallahassee, FL

Dear David,

By virtue of this letter we are updating and continuing our agreement that it is unnecessary for your office to request FNAI element occurrence data for each land management plan you prepare, under the following conditions:

- FNAI will continue to provide our Florida Element Occurrence GIS database to FWC on a quarterly update basis;
- The FNAI GIS data will be available to FWC staff for reference and incorporation as required in management plan review and preparation.

Our database manager, Frank Price, currently provides this update via ftp to FWC staff on a quarterly basis. Current FWC contacts for the quarterly update are Beth Stys and Ted Hoehn. We are pleased to continue this beneficial collaboration with the Florida Fish and Wildlife Conservation Commission.

Sincerely,

Gary Knight
Director
Florida Natural Areas Inventory



Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

Tracking Florida's Biodiversity

13.5 FWC Agency Strategic Plan

Florida Fish and Wildlife Conservation Commission
Agency Strategic Plan
2014 – 2019

Theme One – Florida’s Fish and Wildlife Populations and Their Habitats

Goal 1: Ensure the sustainability of Florida’s fish and wildlife populations.

Strategies:

1. Manage listed species so they no longer meet Florida’s endangered and threatened listing criteria.
2. Manage species to keep them from meeting Florida’s endangered and threatened listing criteria.
3. Anticipate and address fish and wildlife species’ conservation needs in light of adaptation to long-term environmental changes.
4. Develop, acquire and apply the appropriate biological and sociological science to inform fish and wildlife conservation decisions.
5. Inform and guide partners regarding how their regulations, policies, procedures and other actions affect fish and wildlife conservation.
6. Protect fish and wildlife species through effective outreach and enforcement.

Goal 2: Ensure sufficient habitats exist to support healthy and diverse fish and wildlife populations.

Strategies:

1. Use science to determine quantity, quality and location of the habitats most critical to sustain healthy and diverse fish and wildlife populations.
2. Protect lands and waters critical to sustaining healthy and diverse fish and wildlife populations through diverse incentive programs.
3. Manage habitats to sustain healthy and diverse fish and wildlife populations.

Theme Two – Interactions with Fish and Wildlife, including Fishing, Hunting, Boating and Wildlife Viewing Opportunities

Goal 1: Provide residents and visitors with quality fishing, hunting, boating and wildlife viewing opportunities that meet their needs and expectations while providing for the sustainability of those natural resources.

Strategies:

1. Develop, acquire and use the appropriate biological and sociological science necessary to provide sustainable fishing, hunting, boating and wildlife viewing opportunities that meet the needs and expectations of user groups while providing for the sustainability of those resources.
2. Manage fish and wildlife populations to provide sustainable fishing, hunting, and wildlife viewing opportunities.
3. Develop and maintain widely available, diverse and accessible fishing, hunting, boating and wildlife viewing opportunities that meet the needs and expectations of residents and visitors while providing for the sustainability of those resources and emphasizing partnerships with both public and private landowners.
4. Recruit and manage sustainable levels of resident and visitor participation in fishing, hunting, boating and wildlife viewing.
5. Provide targeted fishing, hunting, boating and wildlife viewing programs for youth, the disabled and veterans.

Goal 2: Enhance the safety and outdoor experience of those who hunt, fish, boat and view wildlife.

Strategies:

1. Provide and promote opportunities for residents, and visitors to learn safety practices for fishing, hunting, boating and wildlife viewing.
2. Enhance the boating safety and waterway experience of residents and visitors through improved access, management, education and enforcement.
3. Promote Florida's outdoor environment as a safe and healthy recreational option for residents and visitors.
4. Address the growing disconnect between people and nature by marketing and providing opportunities and education for diverse age, race, gender, ethnic and other demographic sectors.

Goal 3: Use minimal regulations to manage sustainable fish and wildlife populations, manage access to fish and wildlife resources, and protect public safety.

Strategies:

1. Continually evaluate proposed and existing regulations, based on resource management benefits, public safety concerns, and economic and social impacts, to improve or eliminate regulations as warranted.
2. Coordinate with partners and stakeholders to ensure that appropriate authorities and regulations exist to maintain sustainable fish and wildlife populations.
3. Implement and enforce regulations in an informative, proactive and influential manner to enrich resident and visitors' outdoor experience while safeguarding the natural resources.

Goal 4: Minimize adverse environmental, social, economic and health and safety impacts from fish, wildlife and plants that are known, or have a potential, to cause adverse impacts.

Strategies:

1. Manage species and their habitats, as well as species and human interactions, to eliminate or reduce the adverse environmental, social, economic and health and safety impacts from native and non-native fish, wildlife and plants.
2. Effectively communicate to residents, visitors and businesses how to be safe and act responsibly when interacting with or possessing fish, wildlife and plants.
3. Manage captive and non-native wildlife movement and trade through proactive and responsive enforcement, regulation and education, with an emphasis on species that pose a high risk to our native fish and wildlife.
4. Enhance partnerships to address adverse environmental, social, economic and health and safety impacts from fish, wildlife and plants and ensure a consistent and integrated approach with FWC.

Theme Three – Sharing Responsibility for Fish and Wildlife Conservation and Management with an emphasis on developing conservation values in our youth

Goal 1: Ensure current and future generations support fish and wildlife conservation.

Strategies:

1. Expand and promote the Florida Youth Conservation Centers Network through leveraging FWC programs and staff, and developing public and private partnerships and sponsorships.

2. Develop and deliver standardized youth conservation curricula and fishing, hunting, boating and wildlife viewing outdoor activity programs, and assist with adapting programs and curricula to meet the needs of diverse communities.
3. Foster stewardship and shared responsibility for fish and wildlife conservation through conservation education programs.
4. Expand marketing and outreach to reach diverse audiences and engage all staff in priority outreach initiatives.

Goal 2: Ensure residents, visitors, stakeholders and partners are engaged in the processes of developing and implementing conservation programs.

Strategies:

1. Foster a common vision among partners and the FWC to maintain and enhance fish and wildlife populations and their habitats through interagency coordination, mutually beneficial goals and initiatives.
2. Engage residents, visitors, stakeholders and partners to understand their perspectives, develop and implement conservation programs, and implement fishing, hunting, boating and wildlife viewing management activities.
3. Use citizen science to enhance conservation programs.

Goal 3: Increase opportunities for residents and visitors, especially youth, to actively support and practice fish and wildlife conservation stewardship.

Strategies:

1. Inform residents and visitors about conservation stewardship and encourage their active involvement in achieving conservation of fish and wildlife.
2. Provide and promote opportunities for residents and visitors, especially youth, to participate in conservation stewardship activities, including FWC volunteer opportunities.

Goal 4: Encourage communities to conserve lands and waters critical to sustaining healthy and diverse fish and wildlife populations.

Strategies:

1. Provide communities with the necessary assistance to help them obtain the social and economic benefits of local conservation lands.
2. Provide residents and visitors with relevant information on the social and economic benefits of conservation, fishing, hunting, boating, and wildlife viewing.

3. Support community events and programs that promote fish and wildlife conservation.

Theme Four – Responsive Organization and Quality Operations

Goal 1: Integrate our commitment to benefit the community and enhance the economy through our conservation efforts and public service.

Strategies:

1. Identify and implement ways to support Florida businesses and job growth while managing fish and wildlife.
2. Identify and promote opportunities for staff to benefit local communities through participation in approved activities where FWC resources can be used (for example, the Florida State Employees' Charitable Campaign, the Guardian ad Litem Program, mentoring programs, FWC Disaster Response Teams, and American Red Cross Disaster Services).
3. Provide residents and visitors with reliable and current information on Florida's fish and wildlife.
4. Continue to attract visitors by providing top-quality fishing, hunting, boating and wildlife viewing opportunities.

Goal 2: Provide resources and support for the safety and protection of residents and visitors, our natural and cultural resources, and for emergency responses to critical incidents and environmental disasters.

Strategies:

1. Identify existing and emerging risks to the safety of residents and visitors and foster internal collaboration and external partnerships necessary to effectively manage, reduce or eliminate those risks.
2. Provide immediate and effective disaster response and recovery through mutual-aid efforts with local, state and federal partners.
3. Provide search, rescue, and recovery services in coordination with local, state and federal entities to ensure the safety of residents and visitors.
4. Protect natural and cultural resources through proactive and responsive enforcement efforts.

Goal 3: Ensure the FWC has highly effective and adaptive business practices.

Strategies:

1. Address emerging biological, social and economic trends, anticipate impacts and take advantage of opportunities to accomplish FWC's mission.
2. Expect each employee to be an ambassador for FWC and its mission to Florida's diverse residents and visitors.
3. Provide efficient and effective service to Florida's diverse residents, visitors, and FWC staff.
4. Foster a diverse, accountable, responsive and skilled workforce who effectively serves Florida's residents and visitors.
5. Manage existing and secure additional resources necessary to achieve fish and wildlife conservation and meet residents, visitor and stakeholder needs.
6. Create and maintain an effective business model that supports the FWC's mission by using continuous improvement approaches that foster a collaborative and professional culture.

13.6 Land Management Review 2009

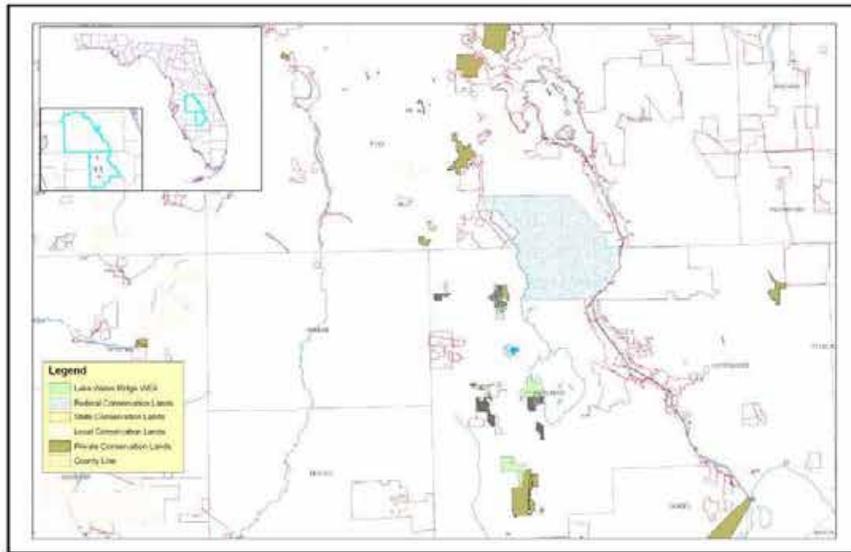
Name of Site: Lake Wales Ridge WEA

County: Highlands County

Managed by: Fish and Wildlife Conservation Commission

Acres: 15,257 Acres

Review Date: 06/16/09



Review Team Determination

Managed in accordance with acquisition purpose? Yes = 6, No = 0



Management practices, including public access, in compliance with the management plan? Yes =6, No = 0



Categories	Management Plan Review	Field Review
Natural Communities	0.75	3.79
Listed Species	0.22	2.58
Natural Resource Survey	0.50	3.07
Cultural Resources	0.83	2.43
Prescribed Fire	0.28	3.14
Restoration	0.00	3.46
Exotic Species	0.22	2.81
Hydrology	0.21	4.04
Groundwater Monitoring	N/A	N/A
Surface Water Monitoring	0.67	2.00
Resource Protection	0.92	3.90
Adjacent Property Concerns	0.61	2.58
Public Access & Education	0.85	3.36
Management Resources	N/A	3.55
Managed Area Uses	1.00	N/A
Buildings, Equipment, Staff & Funding	N/A	3.79

Consensus Commendations to the Managing Agency

The following commendations resulted from discussion and vote of the review team members.

1. The team commends the FWC for the improvements made to the property in recent years to include erecting fences for resource protection, reducing illegal trespass and providing limited public access, and establishing a program of site inspections. (VOTE: 6+, 0-)
★★★★★★
2. The team commends the FWC for providing recreational opportunities on the property while protecting the sensitive natural resources. (VOTE: 6+, 0-)
★★★★★★
3. The team commends the FWC for completing the Peace Pond/marsh restoration project. (VOTE: 6+, 0-)
★★★★★★
4. The team commends the FWC for the increased use of prescribed fire for habitat management facilitated by appropriate mechanical treatments. (VOTE: 6+, 0-)
★★★★★★

Consensus Recommendations to the Managing Agency

The following recommendations resulted from a discussion and vote of review team members. The management plan must include responses to the recommendations identified below.

1. The team recommends increased surveys and monitoring of species of priority to include scrub enemies. (VOTE: 6+, 0-)
★★★★★★
Managing Agency Response: Agreed. A strategy will be developed within the next five years by the Wildlife Conservation, Prioritization, and Recovery Program (WCPR) which will identify management and monitoring needs of extant imperiled wildlife species.
2. The team recommends that the next management plan have the actual FNAI community maps match the community descriptions. (VOTE: 6+, 0-)
★★★★★★
Managing Agency Response: Agreed. Natural community mapping is being completed as part of the FWC Objective Based Vegetation Monitoring (OBVM) program. These maps will be included in the next CMP.
3. The team recommends that one of the field staff attend the Division of Historical Resource's Archaeological Resources Monitor training. (VOTE: 6+, 0-)
★★★★★★
Managing Agency Response: Agreed. At least one member of the staff will be trained as an archaeological monitor. This is contingent upon the lifting of current travel restrictions.
4. The team recommends that FWC assess the need for a hydrological survey to be conducted on the Lake Placid Scrub and Sun Ray parcels. (VOTE: 6+, 0-)
★★★★★★
Managing Agency Response: Agreed. A plan for hydrologic assessments will be included in the next CMP. FWC staff generally does not possess the required skills to conduct this type of assessment, so most of the work would be conducted using contractual services.

Checklist Findings

The following items received high scores on the review team checklist, which indicates that management actions exceeded expectations.

- Natural Communities, specifically sandhill, scrub, scrubby flatwoods, swale, seepage slope, wet prairie, hydric hammock, basin swamp, blackwater stream, depression marsh, clastic upland lake and mesic flatwoods.
- Listed Species, specifically animal inventory.
- Natural Resource survey, specifically invasive species survey and monitoring.
- Cultural resources, specifically cultural resource survey, protection and preservation.
- Non native, invasive problem species specifically control of plants.
- Ground and Surface Water Monitoring, specifically surface water quality.
- Resource protection, specifically boundary survey, gates and fencing, signage, and law enforcement presence.
- Adjacent property concerns, specifically expanding development and inholdings/additions.
- Public access and education, specifically roads, parking, wildlife, invasive species, habitat management activities, interpretive facilities and signs, recreational opportunities and management of visitor impacts.
- Managed area uses, specifically wildlife viewing, hunting, biking, hiking, and horseback riding.

The following items received low scores on the review team checklist, which indicates that management actions noted during the Field Review (FR) were not considered sufficient (less than 2.5 score on average), or that the text noted in the Management Plan Review (PR) does not sufficiently address this issue (less than .5 score on average.). The management plan must include responses to the checklist items identified below:

1. Discussion in the management plan regarding Listed Species, specifically Scrub Jay, Gopher Tortoise, Plant Inventory, and Scrub Lupine (PR). Sand Skink, Blue Tailed Mole Skink and Ziziphus (FR).

Managing Agency Response: Agreed. These subjects will be addressed in the next CMP. For example, although the current plan has seven pages devoted to scrub jays, it does not mention their management or monitoring. The scrub jay populations on many of the WEA properties are surveyed every year through Archbold Biological Station and TNC's Jay Watch program. Regarding gopher tortoises, sand skinks, and blue tailed mole skinks, we agree the next CMP should address management issues. Ziziphus was recently discovered at the Carter Creek tract and scrub lupine was recently introduced to the Lake Blue tract as part of a USFWS grant in conjunction with Bok Tower.

2. Discussion in the management plan regarding Natural Resource Surveys, specifically game wildlife habitat monitoring, listed species/habitat monitoring, other non-game species/habitat monitoring, fire effects monitoring and other habitat management effects monitoring. (PR)

Managing Agency Response: Agreed. FWC has initiated Objective Based Vegetation Monitoring (OBVM) to interject more science into management decisions. OBVM is a vegetation monitoring program that triggers management actions based on desired future conditions for each habitat type. OBVM will be discussed in detail in the next CMP. Another FWC initiative, Land Management Information Systems (LMIS), tracks all management performed on FWC properties. Additionally, a strategy will be developed within the next five years by the Wildlife Conservation, Prioritization, and Recovery Program (WCPR) which will identify management and monitoring needs of extant imperiled wildlife species.

3. Discussion in the management plan regarding Cultural Resources, specifically Protection and Preservation. (FR)

Managing Agency Response: Agreed. A few tracts have been surveyed for cultural resources. WEA staff will generally include at least one employee who is trained as an archaeological monitor. Protection of these resources will be discussed in the next CMP.

4. Discussion in the management plan regarding Resource Management, specifically Area being Burned, Frequency and Quality. (PR)

Managing Agency Response: Agreed. FWC is currently developing a new fire management plan for the various WEA tracts. The burn schedule will be updated. The OBVM program (discussed above) will guide management actions based on desired future habitat conditions.

5. Discussion in the management plan regarding Restoration of Ruderal Areas, specifically Improved Pasture to Basin Marsh, Disturbed Scrub Habitat, and Groundcover Restoration. (PR)

Managing Agency Response: Agreed. There are numerous areas within the WEA that will require restoration. These areas will be discussed in the next CMP. FWC has initiated one ground cover restoration project and one large scale hydrologic restoration project on the Royce unit.

6. Discussion in the management plan regarding Non-Native, Invasive and Problem Species, specifically Prevention of plants and animals, and control of animals (PR). Prevention and Control of Pests/Pathogens(FR)

Managing Agency Response: Agreed. Treatment of exotic plants and animals will be discussed in the next CMP. Currently, FWC has an aggressive program aimed at exotic vegetation control. The most up-to-date science will be discussed and implemented concerning the control of exotic pests.

7. Discussion in the management plan regarding Hydrologic/Geologic Function, specifically Roads, Culverts, Ditches, Hydro-period Alteration, Water Level Alteration, Dams, Reservoirs or Other Impoundments. (PR)

Managing Agency Response: Agreed. FWC has successfully restored a 200-acre freshwater marsh, overland flow to several hundred acres of cuthroat seep, and restored five seasonal wetlands on the Royce Unit. Other properties will require the development of hydrologic plans and these will be discussed in the next CMP. Numerous erosion control issues will also be discussed.

8. Discussion in the management plan regarding Surface Water Monitoring, specifically Surface Water Quality. (FR)

Managing Agency Response: Agreed. Archbold Biological Station conducts some surface water monitoring for Mary's Creek located south of the McJunkin tract. Water passing through McJunkin via a ditch is sampled. The Southwest Florida Water Management District is establishing monitoring wells on the McJunkin and Lake Placid Scrub tracts to monitor both surface and ground water. A discussion on this topic will be included in the next CMP.

9. Discussion in the management plan regarding Adjacent Property Concerns, specifically FGT Pipeline (PR) and Inholdings/Additions. (FR)

Managing Agency Response: Agreed. FWC has worked with the FGT pipeline to make recommendations to limit the loss of scrub habitat on the McJunkin tract. FWC has worked, and will continue to work closely with DEP, TNC, USFWS, Highlands County and others to identify and acquire inholdings and additions. These considerations will be discussed in the next CMP.

APPENDIX A:

PLAN REVIEW		1	2	3	4	5	6	AVERAGE
Natural Communities (I.A)								
Sandhill	I.A.1	1	0	1	0	1	1	0.67
Scrub	I.A.2	1	0	1	0	1	1	0.67
Scrubby Flatwoods	I.A.3	1	0	1	0	1	1	0.67
Swale, Seepage Slope, Wet Prairie	I.A.4	1	1	1	0	1	1	0.83
Hydric Hammock, Basin Swamp, Blackwater Stream	I.A.5	1	1	1	0	1	1	0.83
Depression Marsh	I.A.6	1	1	1	0	1	1	0.83
Clastic Upland Lake	I.A.7	1	0	1	0	1	1	0.67
Mesic Flatwoods	I.A.8	1	1	1	0		1	0.80
Listed species:Protection & Preservation (I.B)								
Animal Inventory	I.B.1	1	0	1	1	1	0	0.67
Scrub Jay	I.B.1.a	0	1	1	1	0	0	0.50
Sand Skink	I.B.1.b	0	0	0	0	0		0.00
Blue Tailed Mole Skink	I.B.1.c		0	0	0	0	0	0.00
Gopher Tortoise	I.B.1.d	0	0	1	0	0		0.20
Plant Inventory	I.B.2	0	0	0	0	0	1	0.17
Scrub Lupine	I.B.2.a	0	0	0	0		1	0.20
Ziziphus	I.B.2.b		0	0	0		0	0.00
Natural Resources Survey/Management Resources (I.C)								
Game wildlife / habitat monitoring	I.C.1	1	1	0	1	0	0	0.50
Listed species / habitat monitoring	I.C.3	0	0	1	1	0	1	0.50
Other non-game species / habitat monitoring	I.C.4	0	0	0	1	0	1	0.33
Fire effects monitoring	I.C.5	0	1	0	1	0	1	0.50
Other habitat management effects monitoring	I.C.6	0	1	0	1	0	1	0.50
Invasive species survey / monitoring	I.C.7	1	1	0	1	0	1	0.67
Cultural Resources (Archeological & Historic sites) (II.A,II.B)								
Cultural Res. Survey	II.A	1	0	1	1	1	1	0.83
Protection and preservation	II.B	1	1	1	1	1	0	0.83
Resource Management, Prescribed Fire (III.A)								
Area Being Burned (no. acres)	III.A.1	0	0	0	1	0	0	0.17
Frequency	III.A.2	0	1	0	1	0	0	0.33
Quality	III.A.3	0	1	0	1	0	0	0.33
Restoration of Ruderal Areas (III.B)								
Improved Pasture to Basin Marsh	III.B.1	0	0	0	0	0	0	0.00

Disturbed Scrub Habitat	III.B.2	0	0	0	0	0	0	0.00
Groundcover Restoration	III.B.3	0	0	0	0	0	0	0.00
Non-Native, Invasive & Problem Species (III.E)								
Prevention								
prevention - plants	III.C.1.a	0	1	0	0	0	1	0.33
prevention - animals	III.C.1.b	0	1	0	0	0		0.20
prevention - pests/pathogens	III.C.1.c	0		0	0	0		0.00
Control								
control - plants	III.C.2.a	1		0	1	0	1	0.60
control - animals	III.C.2.b	0		0	0	0	1	0.20
control - pest/pathogens	III.C.2.c			0	0	0		0.00
Hydrologic/Geologic function Hydro-Alteration (III.F.1)								
Roads/culverts	III.D.1.a	0	0	1	0	0	1	0.33
Ditches	III.D.1.b	0	0	0	0	0	1	0.17
Hydro-period Alteration	III.D.1.c	0	0	0	0	0	1	0.17
Water Level Alteration	III.D.1.d	0	0	0	0	0	1	0.17
Dams, Reservoirs or other impoundments	III.D.1.e	0	0		0	0	1	0.20
Surface Water Monitoring (III.F.3)								
Surface water quality	III.D.3.a	0	1	1	1	0	1	0.67
Resource Protection (III.G)								
Boundary survey	III.E.1	0	1	1	1	1	1	0.83
Gates & fencing	III.E.2	1	1	1	1	1	1	1.00
Signage	III.E.3	1	1	1	1	1	0	0.83
Law enforcement presence	III.E.4		1	1	1	1		1.00
Adjacent Property Concerns (III.H)								
Land Use								
Expanding development	III.F.1.a	1	3	1	1	0	1	1.17
FGT Pipeline	III.F.1.b	0		0	0	0	0	0.00
Inholdings/additions	III.F.2	1	3	0	0	0	0	0.67
Public Access & Education								
Public Access								
Roads	IV.1.a	1	1	1	1	1	1	1.00
Parking	IV.1.b	0	1	1	1	1	1	0.83
Environmental Education & Outreach								
Wildlife	IV.2.a	1	1	1	1	1	1	1.00
Invasive Species	IV.2.b	1	1	1	1	1	0	0.83
Habitat Management Activities	IV.2.c	1	1	1	1	1	0	0.83
Interpretive facilities and signs	IV.3	1	1	0	1	1	0	0.67
Recreational Opportunities	IV.4	1	1	1	1	1	1	1.00
Management of Visitor Impacts	IV.5	1	0	1	1	1	0	0.67
Managed Area Uses								
Existing Uses								

Wildlife Viewing	VI.A.1	1	1	1	1	1	1	1.00
Hunting	VI.A.2	1	1	1	1	1	1	1.00
Biking	VI.A.3	1	1	1	1	1	1	1.00
Hiking	VI.A.4	1	1	1	1	1	1	1.00
Horseback Riding	VI.A.5	1	1	1	1	1	1	1.00
FIELD REVIEW		1	2	3	4	5	6	AVERAGE
Natural Communities (I.A)								
Sandhill	I.A.1	3	3	3	3	3	2	2.83
Scrub	I.A.2	4	4	4	4	4	3	3.83
Scrubby Flatwoods	I.A.3	3	4	4	4	3	3	3.50
Swale, Seepage Slope, Wet Prairie	I.A.4	3	4	3	4	3	4	3.50
Hydric Hammock, Basin Swamp, Blackwater Stream	I.A.5	X	5	3	X	5	X	4.33
Depression Marsh	I.A.6	4	4	3	X	4	4	3.80
Clastic Upland Lake	I.A.7	X	5	3	X	5	5	4.50
Mesic Flatwoods	I.A.8	4	4	4	X		4	4.00
Listed species:Protection & Preservation (I.B)								
Animal Inventory	I.B.1	4	3	3	3	3	X	3.20
Scrub Jay	I.B.1.a	1	4	4	4	1	X	2.80
Sand Skink	I.B.1.b	1	1	2	X	1	X	1.25
Blue Tailed Mole Skink	I.B.1.c		1	2	X	3	X	2.00
Gopher Tortoise	I.B.1.d	1	2	3	X		X	2.00
Plant Inventory	I.B.2	4	3	3	3	4	4	3.50
Scrub Lupine	I.B.2.a	3	4	4	4	2	X	3.40
Ziziphus	I.B.2.b		2	3	X		X	2.50
Natural Resources Survey/Management Resources (I.C)								
Game wildlife / habitat monitoring	I.C.1	4	3	3	3	3	X	3.20
Listed species / habitat monitoring	I.C.3	1	4	3	3	2	X	2.60
Other non-game species / habitat monitoring	I.C.4	1	4	4	3	X	X	3.00
Fire effects monitoring	I.C.5	2	3	3	3	2	X	2.60
Other habitat management effects monitoring	I.C.6	3	4	3	3	4	X	3.40
Invasive species survey / monitoring	I.C.7	5	3	4	3	3	X	3.60
Cultural Resources (Archeological & Historic sites) (II.A,II.B)								
Cultural Res. Survey	II.A	X	3	3	1	2	4	2.60
Protection and preservation	II.B	X	3	3	1	2	X	3.25
Resource Management, Prescribed Fire (III.A)								
Area Being Burned (no. acres)	III.A1	4	2	3	1	3	4	2.83
Frequency	III.A.2	4	3	3	4	2	X	3.20
Quality	III.A.3	4	3	3	3	4	X	3.40
Restoration of Ruderal Areas (III.B)								
Improved Pasture to Basin Marsh	III.B.1	4	5	5	4	4	4	4.33

Disturbed Scrub Habitat	III.B.2	1	3	3	4	3	3	2.83
Groundcover Restoration	III.B.3		3	3	3	4	3	3.20
Non-Native, Invasive & Problem Species (III.E)								
Prevention								
prevention - plants	III.C.1.a	3	3	3	1	3	X	2.60
prevention - animals	III.C.1.b	3	3	3	1	3		2.60
prevention - pests/pathogens	III.C.1.c	3	X	3	1	3		2.50
Control								
control - plants	III.C.2.a	4	4	4	4	4	X	4.00
control - animals	III.C.2.b	4	3	3	1	3		2.80
control - pest/pathogens	III.C.2.c	X	X	3	1	3		2.33
Hydrologic/Geologic function Hydro-Alteration (III.E.1)								
Roads/culverts	III.D.1.a	4	4	4	3	4	4	3.83
Ditches	III.D.1.b	5	4	3	2	4	5	3.83
Hydro-period Alteration	III.D.1.c	5	4	4	3	5	5	4.33
Water Level Alteration	III.D.1.d	4	5	4	2	5	5	4.17
Dams, Reservoirs or other impoundments	III.D.1.e	X	X			X		0.00
Surface Water Monitoring (III.E.3)								
Surface water quality	III.D.3.a	1	X	2	X	3	X	2.00
Resource Protection (III.F)								
Boundary survey	III.E.1	4	3	4	4	5		4.00
Gates & fencing	III.E.2	5	5	4	5	5		4.80
Signage	III.E.3	5	3	3	3	5		3.80
Law enforcement presence	III.E.4	3	3	3	3	3		3.00
Adjacent Property Concerns (III.G)								
Land Use								
Expanding development	III.F.1.a	2	3	3	2	3		2.60
FGT Pipeline	III.F.1.b	3		3	2	3		2.75
Inholdings/additions	III.F.2	1	3	2	2	4		2.40
Public Access & Education								
Public Access								
Roads	IV.1.a	3	4	4	3	3		3.40
Parking	IV.1.b	5	4	3	2	3		3.40
Environmental Education & Outreach								
Wildlife	IV.2.a		4	4	3	5		4.00
Invasive Species	IV.2.b		4	3	3	3		3.25
Habitat Management Activities	IV.2.c	5	4	4	3	3		3.80
Interpretive facilities and signs	IV.3	4	4	2	2	3		3.00
Recreational Opportunities	IV.4	4	4	3	2	3		3.20
Management of Visitor Impacts	IV.5	3	4	3	1	3		2.80
Management Resources								
Maintenance								
Waste disposal	V.1.a	3	3	3	X	4	5	3.60
Sanitary facilities	V.1.b	3	3	3	X	X	5	3.50
Infrastructure								

Buildings	V.2.a	4	3	4	4	4	5	4.00
Equipment	V.2.b	4	4	4	4	5	5	4.33
Staff	V.3	4	3	4	3	2	4	3.33
Funding	V.4	4	3	4	3	3	4	3.50

APPENDIX B:

I.A. Natural Communities

- Better sync between plan and checklist would be very helpful.
- No habitat specific management strategies provided.
- The management plan provides good description of each of the major FNAI natural communities, however no acreage is included and the track maps use land sat vegetative types and doesn't correlate at all with the text descriptions of each community. Much of the property is currently limited in management due to partial ownership of the subdivision parcels (mega parcels). Management plan should provide more strategies on description of management actions needed for each of the natural communities. Mechanical treatment with the synoptic prior to burning in the scrub and sandhill seems to have allowed the managers to jumpstart restoration of over grown habitat. Efforts will be needed to continue the use of fire to maintain these sites. More frequent burning and more growing season fire are recommended strategies to continue this successful restoration. The mesic flatwoods looked good, again continue to focus on frequency of burning. Some depression marshes and wetland eco-tones (bayheads edges) had too much land wood vegetation and pine canopy, indicating the need for fire frequency and/or mechanical control.
- Management needs should be addressed by community in the management plan. Each community should exhibit relative problems, goals, objectives and strategies.
- The plan does not contain specific goals for natural communities. I recommend using current condition/desired future condition/management actions to attain desired future conditions as a format for each community. The natural communities descriptions and management needs are well written and thorough. Because LWR WEA is so complex a way to depict, keep track of, and set goals for areas that are manageable with fire is needed. It is surely a daunting task to try to keep up with which places need to burn and when.
- The maps were very difficult to use, which makes it difficult to understand some of the problems. NC descriptions do not easily reflect protection goals. FNAI vs Land Sat- not able to compare/analyze.

I.B. Listed Species

- Plant surveys are headed to better monitor management.
- Management plan deficient regarding sand skinks, a federally listed species.
- Increased burning in Carter Creek to create more scrub jay habitat. Additional animal species should be addressed in management plan (ie gopher tortoise, woodstocks, sand skinks, etc). high need for plant management.
- Scrub jays are covered well in the plan. There is much less known about sand skinks. The effect of burning mulched scrub may be very detrimental to fossorial vertebrates such as sand skinks. I did not see this addressed in the plan. Rare plants were addressed in a general way but I did not see anything specific about monitoring management effects on rare plants.
- Should add sand skink research. Management plan should be written for T&E plants.

I.C. Natural Resources Survey/Management Resources

- Reference OBVM in new plan.
- Good recent efforts at vertebrate surveys.
- Needs monitoring of output of small game hunts.
- More detailed direction is needed about monitoring. What level will be done over how much of the property by whom. With so much scattered land to manage, managers will have to be very selective and focused.

II.A.B. Cultural Resources

- Need an archeological monitor on site.
- Complete survey not completed.
- No one on staff has been through the archeological site monitoring class. I suggest one staff member complete the class.

III.A. Prescribed Fire

- 1,000 acres a year of 8,000 burnable.

- Annual management goal here on 8,000 acres is just 1,000 acres- which strikes me as a bit low; however all the burning (despite one escape) looked pretty good. I suggest continued efforts to increase fire frequencies- especially in the scrub habitat in a restoration phase.
 - Need for increased area being burned. 1,000 acres are burned annually out of 8,000 deemed burnable.
 - There should be an annual goal for a number of burns per year needed at each site. The managers are doing admirably considering the constraints of inholdings, scattered parcels, competing responsibilities etc. there is not a fire management section in the plan that outlines the basic standards, protocols, requirements for burning. Is there a separate document? Fire regime and other fire issues are addressed under the communities sections but there should be a complete fire management plan or section of this document.
- III.B. Restoration**
- Need specific reference to restoration projects.
 - Excellent expensive and extensive hydrologic project to restore basin marsh in the Royce parcel.
 - There should be a restoration section that outlines specific areas targeted for restoration and a timeline and budget.
- III.C. Non-native, Invasive & Problem Species**
- Use DEP/FWC exotic plant control contract.
 - Good efforts at receiving BIPM grants. All existing invasive plants are in a maintenance condition- although the creek unit has not been surveyed and cogon grass was observed. Lygodium has become more common in the bayheads.
 - Again, there should be a section dedicated to this.
- III.D. Hydrologic/Geologic Function**
- Water quality near Daisy and Mesunkin sites.
 - Peace Pond restoration completed. WMD doing ground water monitoring.
 - More assessment is needed on the Lake Placid scrub site on the west side. Need to address the need for testing of water runoff from dairy adjacent to the McJunkin parcel.
 - FWC does not do the water monitoring, WMD does it.
 - Could go under restoration section.
- III.E. Resource Protection**
- Excellent job of improving the fencing along the boundaries, especially on the Carter Creek parcel. More WEA conservation area/identification signs at appropriate locations extending the property are suggested.
 - Needs increased law enforcement presence. Signage shows room for improvement.
 - Adequate coverage in plan. The managers are to be commended for the accomplishments in the field on this. Kudos.
 - Signage is needed- inviting signs and interpretive signs.
- III.F. Adjacent Property Concerns**
- More effort is needed by FWC on DSL to respond favorably to the county's offer to vacate the road right of ways in the Carter creek tract. Acquisition efforts are concentrated on the Carter creek parcel which has limited progress in this area.
 - Acquisition of Carter creek right of ways from the county should be expedited.
 - I did not see this addressed in the plan, other than numerous mentions of the need to resolve the inholdings acquisitions.
- IV. Public Access and Education**
- Public access sites still need some work in terms of parking, signage and kiosks. The new access at Carter creek is not yet open to the public. FWC recreation services is due to visit the site and prepare recommendations for improvements.
 - Need to increase shell area of Lake Placid scrub parking lot. Need to increase number of kiosks. Need signs to increase awareness of recreational opportunities and increased monitoring of visitor impacts.
 - More signage.

13.7 FWC Apiary Policy

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Apiary Policy

Division of Habitat and Species Conservation

Issued by:
Terrestrial Habitat Conservation and Restoration Section
9/1/2010

Enclosed is the HSC/THCR Apiary Policy for all Florida Fish and Wildlife Conservation Commission's Wildlife Management Areas and Wildlife and Environmental Areas.

1

DIVISION OF HABITAT AND SPECIES CONSERVATION POLICY

Issued September 2010

**SUBJECT: APIARY SITES ON FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
WILDLIFE MANAGEMENT AREAS AND WILDLIFE AND ENVIRONMENTAL AREAS**

STATEMENT OF PURPOSE: It is the intent of this policy to determine which Florida Fish and Wildlife Conservation Commission (FWC) Wildlife Management Areas or Wildlife and Environmental Areas (WMA/WEA) may have apiary sites, and provides direction on site location, management and administration of said apiaries.

Definitions

Apiary – A place where bees and beehives are kept, especially a place where bees are raised for their honey.

Apiary Site – An area set aside on a WMA/WEA for the purpose of allowing a beekeeper to locate beehives in exchange for a fee as established by contract between the beekeeper and FWC.

Apiary Wait List – An apiary wait list will be maintained by the Terrestrial Habitat Conservation and Restoration (THCR) Section Leader’s Office based on applications received from interested beekeepers. Only qualified apiarists will be added to the list. To become qualified the new apiarist must submit an application form and meet the criteria below under the section titled “Apiary Wait List and Apiary Application.”

Beekeeper/Apiarist – A person who keeps honey bees for the purposes of securing commodities such as honey, beeswax, pollen; pollinating fruits and vegetables; raising queens and bees for sale to other farmers and/or for purposes satisfying natural scientific curiosity.

Best Management Practices – The Florida Department of Agriculture & Consumer Services (FDACS; Division of Plant Industry (DPI), Apiary Inspection Section, P.O. Box 147100, Gainesville, FL 332614-1416) provides Best Management Practices (BMP) for maintaining European Honey Bee colonies and FWC expects apiarists to follow the BMP.

Hive/Colony – Means any Langstroth-type structure with movable frames intended for the housing of a bee colony. A hive typically consists of a high body hive box with cover, honey frames, brood chambers and a bottom board and may have smaller super hive boxes stacked on top for the excess honey storage. A hive/colony includes one queen, bees, combs, honey, pollen and brood and may have additional supers stacked on top of a high body hive box.

Establishment of Apiary Sites on WMA/WEA

During the development of an individual WMA/WEA Management Plan, apiaries will be considered under the multiple-use concept as a possible use to be allowed on the area. "Approved" uses are deemed to be in concert with the purposes for state acquisition, with the Conceptual State Lands Management Plan, and with the FWC agency mission, goals, and objectives as expressed in the agency strategic plan and priorities documents. Items to consider when making this determination can also include:

- Were apiaries present on the area prior to acquisition?
- Are there suitable available sites on the WMA/WEA?
- Will the apiary assist in pollination of an onsite FWC or offsite (adjacent landowner) citrus grove or other agricultural operation?

For those WMA/WEAs that have not considered apiaries in their Management Plan, upon approval of this policy Regional Staff will work with the Conservation Acquisition and Planning (CAP) staff and THCR Section leadership to determine if apiaries are an approved use on the area. If apiaries are considered an approved use then a request will be made to the Division of State Lands to allow this use as part of an amended Management Plan. This request will be made through the THCR's Section Leader's office and coordinated by the CAP.

Determination of apiary site locations on WMA/WEAs should be done using the following guidelines:

- Apiary sites should be situated so as to be at least one-half mile from WMA/WEA property boundary lines, and at least one mile from any other known apiary site. Exceptions to this requirement must be reviewed by the Area Biologist and presented to the THCR Section Leader for approval.
- Site should be relatively level, fairly dry, and not be prone to flooding when bees would normally be present.
- Site should be accessible by roads which allow reasonable transfer of hives to the site by vehicle.
- If a site is to be located near human activity, such as, an agricultural field, food plot, wildlife opening, campsites, etc., or if the site may be manipulated by machinery at a time when bees would be present, then the apiary site should be located at a minimum of 150 to 200 yards from the edge of that activity. This will ensure minimal disturbance to the bees and minimize incidents with anyone working in the area.

- It is preferable to have apiary sites located adjacent to or off roads whenever possible. If traditional apiary sites were located on roads and the Area Biologist determines that the site will not impact use of the road by visitors then it will be allowed.
- FWC Area Biologist shall select apiary site(s) and the site(s) selected should not require excessive vegetation clearing (numerous large trees, dense shrubs) or ground disturbance (including fill).

WMA/WEA Staff Responsibilities

Area Biologist on WMAs/WEAs with approved apiary sites will forward a GIS shapefile depicting all the apiary site polygon(s), including a name or number with coordinates for each apiary site, to the THCR Contract Manager.

Area Biologist will monitor each apiary site no less than once a year to determine if the beekeeper is abiding by the contract requirements. If violations are noted, staff should bring them to the attention of the beekeeper for correction. If violations continue staff should notify the THCR Contract Manager who will determine if or what additional action is warranted.

Area Biologist will establish and maintain firelines around the apiary site to ensure the apiary site is ready when a planned burn is scheduled.

Area Biologist will advise the beekeeper of burn plans, road work, gate closures, or other site conditions and management activities that may affect the beekeeper's ability to manage or access the apiary site.

Area Biologist is not responsible to ensure access roads are in condition suitable for beekeepers to access their hives with anything other than a four wheeled drive vehicle. (The site of the apiary may be high and dry, but the roads accessing them may be difficult to impossible to get a two wheeled drive vehicle into during extreme weather, e.g., heavy rainfall events.)

Apiary Wait List and Apiary Application

An electronic waiting list for apiary sites will be maintained by the THCR's Contract Manager for each WMA/WEA. To be placed on the waiting list an interested beekeeper must submit an apiary application form to the contract manager (See Enclosed Application Form). Each applicant will be considered based on the following criteria:

- Proof of a valid registration with the FDACS/DPI.
- Proof of payment of outstanding special inspection fees for existing sites.
- A validated history of being an apiary manager.
- Three references that can attest to the applicant's beekeeping experience.

If an apiary site is becomes available on a WMA/WEA and there are beekeepers on the waiting list interested in that particular area, those individuals meeting the criteria above will be given preference. If there is more than one beekeeper meeting the criteria with their name on the list then a random drawing will be held by the THCR Contract Manager to determine who will receive the site. Beekeepers on the waiting list will be notified in writing of the random drawing's date/location and will be invited to attend. The individual's name selected during this drawing will be awarded the contract.

Apiary agreements are non-transferable. Each agreement serves as a contract between a specific individual or company and FWC, and the rights and responsibilities covered by an individual agreement cannot be transferred.

Contracts

Apiary contracts are for five (5) years and renewals are contingent upon a satisfactory performance evaluation by Area Biologist and concurrence of the THCR Section Leader. Approval is based on apiarist performance, adherence to rules and regulations and general cooperation. If an Area Biologist decides an apiarist whose contract is expiring is unacceptable he may recommend not approving the new contract. If this transpires then the wait list process using random selection will be used. If there is no apiarist on a current wait list then the apiarists who are in good standing with existing contracts will be notified to see if any want to be put on the wait list for the drawing. If none are interested then the site will be put on hold pending a valid request.

Pricing of Apiary Site(s)

Cost of each apiary site will be \$40 annually which will include up to 50 beehives. Additional beehives will be charged at the rate of \$40 per 50 beehives.

Pricing examples:

- A beekeeper is leasing 2 apiary sites with up to 100 beehives - the fee per year is \$80.
- A beekeeper is leasing 3 apiary sites with up to 200 beehives - the fee per year is \$160.

Note: The maximum number of hives/colonies allowed on an apiary site will be at the discretion of the apiarist. However, the apiarist is strongly recommended to follow the BMP as recommended by the FDACS/DPI. In addition to providing the BMP, FDACS/DPI's management has recommended 50 hives per site in pineland communities and no more than 100 hives per site in areas with bountiful resources. However, FWC will not dictate the number of hives on a site unless they create land management issues.

Bear Depredation Control at Apiary Site(s)

Beekeepers are required to consult with the WMA/WEA Area Biologist to see if electric fencing is required for their apiary sites. If the Area Biologist requires electric fencing then the

Beekeeper shall construct and maintain electric fences for each apiary site. Numerous electric fence designs have been used to varying success and FWC as a courtesy provides an electric fence technical information bulletin with each Agreement. This bulletin is attached in order to assist the Beekeeper and/or provide a design that has been proven to be reasonable effective.

SUBJECT MATTER REFERENCES

Apiary Inspection Law - Chapter 586, Florida Statutes (see <http://www.leg.state.fl.us/Statutes/>), Rule Chapter 5B-54, Florida Administrative Code (see www.flrules.org).

The Board of Trustees of the Internal Improvement Trust Fund – Recommended Apiary Agreement Guidelines For Apiaries & Revisions to an Agreement for Apiary Activities on State Lands on September 23, 1986
S:\HSC\THCR\APIARY.BACKUP.POLICY\dlissupport@dos.state.fl.us_20100903_111446.pdf

Senate Resolution 580, September 21, 2006: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_bills&docid=f:sr580ats.txt.pdf

Attachments

Sample Apiary Agreement W/Attachments (Map Placeholder & Electric Fence Bulletin)

Sample Apiary Site Application Form W/Mission Statement

Best Management Practices for Maintaining European Honey Bee Colonies

Sample of Random Selection Process Procedure

APPROVED:

Division Director or Designee

DATE: _____

APIARY AGREEMENT

AGREEMENT FOR APIARY ACTIVITIES ON STATE LANDS

THIS AGREEMENT is made by and between the Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600, hereinafter known as “the COMMISSION,” and (Insert Name and Address of Apiarist Here), telephone number (Insert Phone Number of Apiarist Here), hereinafter known as “the USER.”

WITNESSETH

In consideration of the mutual promises to be kept by each and the payments to be made by the USER, the parties agree as follows:

1. TERM: This Agreement will begin (Insert date here) or the date signed by both parties, whichever is later, and will end five (5) years from the date of execution. Issuance of a new five (5) year Agreement is contingent upon satisfactory performance evaluation by the Area Biologist and approval of the THCR Section Leader.
2. The COMMISSION Agrees:
 - a. To provide apiary sites on state lands, which will be identified by the COMMISSION staff and located on the property identified in (4)(f) below.
 - b. To provide technical assistance for bear-proofing, if required by Area Biologist, of sites made available under this Agreement.
 - c. To allow the USER to place a total number of (insert number of hive boxes here) hive boxes on the COMMISSION-managed property at the apiary site(s).
3. The USER Agrees:
 - a. To pay (Insert Total Dollars Here) on or before the execution date of this Agreement and each year thereafter on or before anniversary date of the original contract execution date, with check or money order payable to the Florida Fish and Wildlife Conservation Commission. All payments shall be remitted to The Florida Fish and Wildlife Conservation Commission, Finance and Budgeting, Accounting Section, PO Box 6150, Tallahassee, FL 32399-6150, and a copy of the check to The Florida Fish and Wildlife Conservation Commission, Terrestrial Habit Conservation and Restoration Section, Attn: Section Leader, 620 South Meridian Street, Tallahassee, Florida 32399-1600.

- b. To have no more than (Insert Number of Hive boxes here) hive boxes on the property at one time.
- c. To comply with the Florida Honey Certification and Honeybee Law, Chapter 586, Florida Statutes, and Rule 5B-54, Florida Administrative Code, and all other applicable federal, state, or local laws, rules or ordinances.
- d. To not damage, cut or remove any trees in the course of preparing for or conducting operations under this Agreement.
- e. To repair within 30 days of occurrence any damage to roads, trails, fences, bridges, ditches, or other public property caused by USER'S operations under this Agreement based on discretion of the COMMISSION to ensure the WMA/WEA management goals are met. All repairs will be coordinated with the Area Biologist to ensure management goals are met. If USER does not comply within the 30 day requirement, then the COMMISSION may use a third party to perform the repairs and charge the USER accordingly.
- f. To report any forest fires observed and to prevent forest fires during the course of operations under this Agreement.
- g. To abide by all WMA/WEA rules and regulations in addition to items in this Agreement.
- h. To notify the Area Biologist within 24 hours when a bear depredation event occurs.
- i. To post their name in an agreed upon location at each site covered by this Agreement or otherwise use an identifying system that is approved by the Area Biologist.
- j. To furnish proof of general liability insurance prior to starting apiary activities on state property or within 30 days of execution of this Agreement, whichever is earlier, and proof of annual renewal of the general liability insurance policy prior to or upon expiration date of the policy. The USER shall maintain continuous general liability insurance throughout the term of this Agreement for no less than \$300,000 for bodily injury and \$100,000 for property damage for each occurrence. Such a policy shall name the COMMISSION as the Certificate Holder. The USER's current certificate of insurance shall contain a provision that the insurance will not be canceled for any reason during the term of this Agreement except after thirty (30) days written notice to the COMMISSION.

- k. To be liable for all damage to persons or property resulting from operations under this Agreement, and to release, acquit, indemnify, save and hold harmless the COMMISSION, its officers, agents, employees and representatives from any and all claims, losses, damages, injuries and liabilities whatsoever, whether for personal injury or otherwise, resulting from, arising out of or in any way connected with activities under this Agreement or activities occurring from any other source not under this Agreement and the USER further agrees to assume all risks of loss and liabilities incidental to any natural or artificial condition occurring on state lands cover by this Agreement.
 - l. To construct and maintain electric fences, if required by the Area Biologist at the Area Biologist's discretion, to provide protection of apiaries from black bear depredation consistent with the technical information bulletin attached to this agreement, and, if so required, to maintain an open buffer around the fencing of five (5) feet or more. (See Attachment 1)
 - m. To remove all personal property from the site within thirty (30) days of termination or expiration of this Agreement. The USER understands that after this time, all the USER'S personal property remaining on the WMA/WEA shall be deemed abandoned and become the property of the COMMISSION, which will be utilized or disposed of at the sole discretion of the COMMISSION, and that reasonable storage and/or disposal fees and/or costs may be charged to the USER.
4. The parties mutually agree:
- a. This Agreement is not transferable.
 - b. The USER's failure to submit payment by the due date established herein may result in cancellation of the Agreement by the COMMISSION.
 - c. The USER's failure to submit proof of general liability insurance or proof of annual renewal in compliance with (3) (j) above may result in cancellation of this Agreement by the COMMISSION.
 - d. This Agreement shall be in effect for a period of five (5) years and issuance of a new agreement will be contingent upon a satisfactory performance evaluation and approval of the Area Biologist and THCR Section Leader.
 - e. Each apiary site shall be situated so as to be at least one-half (1/2) mile inward from state property lines and there shall be at least one (1) mile separation between sites. Exceptions to this rule must be reviewed by Area Biologist

presented to and approved by the Terrestrial Habitat Conservation and Restoration Section Leader.

- f. The property covered by this Agreement is described as follows: That the property sites (Insert Area Name) Wildlife Management Area are represented by Attachment 2.
- g. In accordance with Section 287.134, Florida Statutes, an entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid, proposal or reply on a contract to provide goods or services to any public entity; may not submit a bid, proposal or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant with any public entity; and may not transact business with a public entity.
- h. As part of the consideration of this Agreement, the parties hereby waive trial by jury in action brought by either party pertaining to any matter whatsoever arising out of or in any way connected with this Agreement. Exclusive venue for all judicial actions pertaining to this Agreement is in Leon County, Florida.
- i. This Agreement may be terminated by the COMMISSION upon thirty (30) days written notice to the USER in the event the continuation of the apiary activities are found to be incompatible with the COMMISSION'S management plans or for any other reason at the sole discretion of the COMMISSION.

This Area Intentionally Left Blank

IN WITNESS WHEREOF, the parties have executed this Agreement on the day and year last below written.

USER SIGNATURE

Date: _____

Witness

Witness

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION

Mike Brooks, Section Leader
Terrestrial Habitat Conservation and
Restoration

Date: _____

Approved as to form and legality

Commission Attorney

Date: _____

AGREEMENT
ATTACHMENT 1

**Use of Electric Fencing to Exclude Bears
And Prevent Property Damage**

Florida Fish and Wildlife Conservation Commission
Technical Information Bulletin (2001)

Electric fencing has proven effective in deterring bears from entering landfills, apiaries (beehives), livestock pens, gardens, orchards, and other high-value properties. Numerous electrical fence designs have been used with varying degrees of success. Design, quality of construction, and proper maintenance determine the effectiveness of an electric fence. The purpose of this technical bulletin is to assist the property owner in understanding and implementing electrical fencing as a tool to exclude and prevent damage caused by black bears.

Understanding Electric Fencing

Electric fencing provides an electrical shock when an animal comes into contact with the electrically charged wires of the fence. People unfamiliar with electric fencing often are afraid that it will injure, permanently damage, or kill an individual or pet that contacts the fence. **This is not true!** A properly constructed electric fence is safe to people, pets, and bears.

Components of Electric Fencing

An electric fence is composed of four main elements: a charger, fence posts, wire, and the ground rod.

Fence Charger. On a small scale electric fence (like that typically needed for bear exclusion), the largest cost is normally the fence charger. A fence charger's job is to send an electrical pulse into the wire of the fence. Contrary to popular belief, there is not a continuous charge of electricity running through the fence. Instead the charger emits a short pulse or burst of electricity through the fence. The intensity and duration of the electrical pulse varies with the type of charger or controller unit. Chargers with a high-voltage, short duration burst capacity are the best because they are harder to ground out by tall grass and weeds. These types are also the safest, because, even though the voltage is high (5 kilovolts) the duration of the burst is very short (2/10,000 of a second) (FitzGerald, 1984).

Two basic energy sources for chargers are batteries (12-volt automotive type) and household current (110 volt). Battery-type chargers are typically cheaper to purchase but require more maintenance because of the necessity of charging the battery. The advantage of a battery powered charger is that it can be used in a remote location where 110-volt current is not available. Most units that are powered by a fully charged 12-volt deep-cycle batteries can last three weeks before needing a charge. Addition of a solar trickle charger will help prolong the duration of effective charge in 12-volt batteries.

Fence Posts. On small scale fences, the posts are normally the second largest expense involved in construction. Therefore, when planning an electric fence it is a good idea to utilize existing fencing in order to save money. If no existing fence is available, posts will need to be placed around the area needing protection. Posts may be wood, metal, plastic, or fiberglass. Wood and metal posts will need to have plastic insulators attached to them which prevent the electric wire from touching the post causing it to ground out. Plastic and fiberglass posts do not need insulators, the wire may be affixed directly to these posts. Wood and metal posts are typically more expensive and require the added expense of insulators, however, they are more durable and generally require less maintenance.

Wire. Fourteen to seventeen gauge wire is the most common size range used in electric fencing. Heavier wire (a lower gauge number) is more expensive but carries current with less resistance and is more durable (FitzGerald, 1984).

The two most common types of wire are galvanized and aluminum. Galvanized wire is simply a steel wire with a zinc coating to prevent rust, which makes the wire last longer. Some wire is more galvanized than others. The degree or amount of zinc coating that is around the core steel wire is measured in three classes. A class I galvanization means the wire has a thinner coating of zinc than a class II galvanization. Class III galvanized wire has the heaviest zinc coating and will last longer than the class I and class II wire (FitzGerald, 1984). In general, the cost of galvanized wire increases as the class or amount of galvanization increases.

Aluminum wire is typically more expensive than the galvanized wire. Some advantages of aluminum wire are: it will not rust, it conducts electricity four times better, and it weighs one-third less than steel wire.

The Ground Rod. The ground is an often overlooked, but critical part of an electric fence. Without a good ground, electricity will not flow through the wire. When an animal touches a charged wire, the body of the animal completes the electrical circuit and the animal feels the "shock". The current must travel from the charger through the wire to the animal and then back through the ground to the charger if the animal is to feel the shock. The soil acts as the return "wire" (ground) in the circuit. However, if a

bird was to land on a charged wire without touching the soil the bird would not complete the circuit and would be unaffected (FitzGerald, 1984). Some fence configurations use actual grounded wires within the fence to enhance the grounding system.

The ground may be a commercial ground rod or a copper tube or pipe driven six to eight feet in moist soil. Copper is expensive, so a copper coated steel pipe or any other good conducting metal pipe will work also. Very dry soil can effect the ability to create a good ground and has sometimes been a problem during drought conditions. Pipe may be a better choice than a solid rod during drought conditions, because water may be poured down the ground pipe to improve the ground. Some fence configurations use wires as the grounding system, rather than relying solely on the soil as a ground.

Recommended Electric Fence to Deter Black Bears

Conditions at fence sites will vary and will determine what the most effective fence configuration will be. Commission biologists welcome the opportunity to visit sites and provide custom tailored advice on constructing an effective electric fence. The following recommendation will cover most situations with low to moderate pressure from black bears. Use a five strand aluminum wire fence that is 40 inches high with wire spacing every eight inches apart using the previously mentioned wired grounding system (see Figure 1). The wire closest to the ground level (the lowest wire) should be a charged or "hot" wire. The second wire should be grounded. The third wire should be hot. The fourth wire should be grounded and the fifth wire should be hot. If using metal or wood posts, insulators must be used to keep the hot wires from grounding out. The cost of this type of electric fence utilizing fiberglass posts and a 110 volt fence charger is approximately \$200 for a 40' x 40' area (160 linear feet of fence).

Materials:

- 1 - 1, 312 foot roll (1/4 mile) 14 gauge aluminum electric fence wire
- 1 - 50 foot roll 12 gauge insulated wire
- 20 - 5 foot 5/8 inch dia fiberglass fence posts
- 5 - plastic gate handles
- 1 - 110 volt fence charger
- 1 - 10 foot ground pipe
- 4 - plastic electric fence signs

Installation. These instructions are for a square shape fence exclusion, but the process would be very similar for other applications. Drive 4 corner posts 1-foot deep into ground and stake with guy wires. Clip, rake, and keep clear any vegetation in a 15-inch wide strip under the fence and apply herbicide. Attach and stretch the aluminum wire at 8-inch increments starting 8 inches from ground level. A loop of wire should be left on each wire at the first corner post. Once the wire has been stretched around the outside of all the corner posts back to the first post a plastic gate handle should be attached to each wire and the gate handles should be attached to each

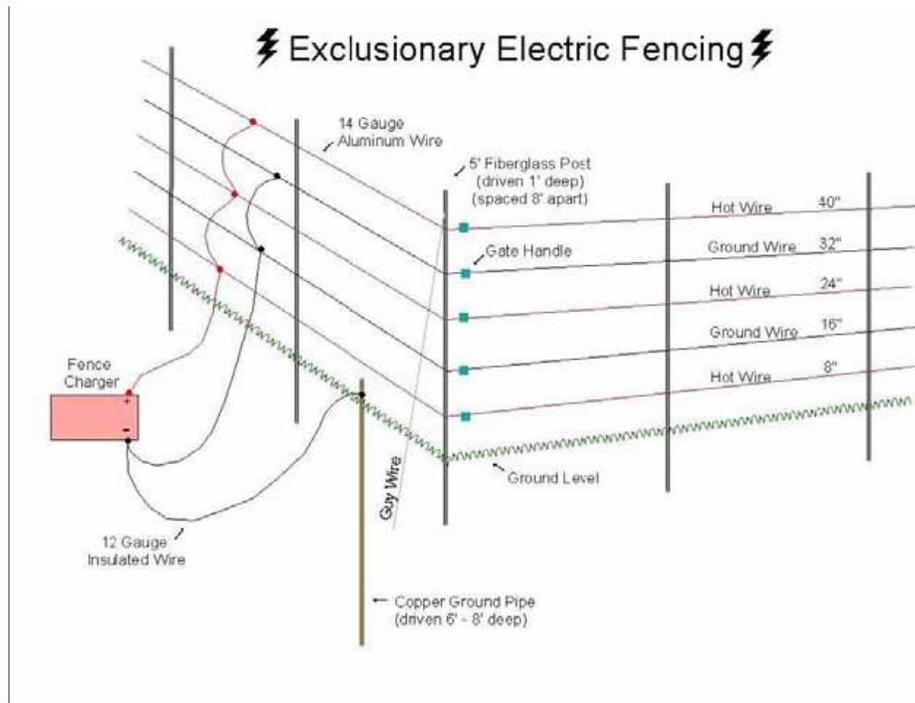
corresponding loop on the first corner post. Drive in the remaining 16 posts to the same depth at 8-foot intervals between corner posts. Secure each of the five wires to each of the posts with additional wire. Attach four plastic electric fence signs (one on each side) to the top wire of the fence. Attach a 12-gauge strand of insulated wire to the positive terminal of the fence charger and attach it to the first, third, and fifth wires of the fence. Attach another 12 gauge insulated wire to the negative terminal of the charger and attach this wire to the ground pipe which has been driven into the ground 6 to 8-feet deep. Attach another 12 gauge insulated wire from the negative terminal of the charger to the second and fourth wires on the fence. Plug the charger into a 110 volt power supply and the fence is in operation.

Tips to improve the effectiveness of your electric fence to deter black bears:

1. If using a 12-volt fence charger, ensure that the battery is charged; check every two weeks.
2. Make sure terminals on the charger and battery are free of corrosion.
3. Make sure hot wires are not being grounded out by tall weeds, fallen tree branches, broken insulators, etc.
4. If fence wires have been broken and repaired, make sure wires are corrosion free where they have been spliced together. Also, tighten the fence at each corner post as wires that have been spliced and are loose make poor connections.
5. Be sure to rake vegetation from under and around the outside of the fence as this may act as an insulator.
6. To improve the ground around the perimeter of the fence add a piece of 24 inch chicken wire laying on the ground around the outside of the fence. This should be connected to ground.
7. During periods of drought pour water down the ground pipe and around the ground pipe to improve the ground. Digging a 6 inch deep 6 inch diameter hole around the ground pipe and back filling with rock salt will also improve the ground. Additional ground pipes may also be added to portions of the fence farthest from the charger.
8. To ensure that the bear solidly contacts the charged portion of the fence, a bait like bacon strips, a can of sardines, or tin foil with peanut butter may be attached to one of the top hot wires. Make sure these do not contact the ground, thus shorting out the fence.
9. When protecting a specific structure (like a shed or rabbit hutch), the fence should be placed 3 to 5 feet away from the structure (rather than on it) so that the bear encounters the fence before reaching the attractant.
10. Protect the fence charger from the elements by covering it with a plastic bucket or a wooden box.
11. Place plastic electric fence signs around the perimeter of your fence to improve visibility and to warn other people.

LITERATURE CITED

FitzGerald, James (1984), *The Best Fences*. Storey Publishing Bulletin A-92, Pownal, Vermont. p. 14-16.



AGREEMENT
ATTACHMENT 2

Place Holder for Map

Of

Apiary Locations

At

WMA/WEA

APIARY SITE APPLICATION FORM

Florida Fish and Wildlife Conservation Commission

RETURN TO: The Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600. Please print or type all information. Attach additional sheets if necessary.

Name _____ Telephone Number _____

Mailing Address _____

City or Town _____ County _____ Zip Code _____

Physical Address (If Different from Mailing Address) _____

Company Name: _____

Email Address _____

Requested Wildlife Management or Wildlife and Environmental Area(s)(see attached list of WMA/WEAs with apiary sites):

WMA/WEA _____ County _____ # of Sites _____

WMA/WEA _____ County _____ # of Sites _____

WMA /WEA _____ County _____ # of Sites _____

WMA /WEA _____ County _____ # of Sites _____

Planned Number of Hives Per Site: _____ Permanent: ____ Seasonal: ____

Member of Beekeepers Association: Yes ____ No ____

Number of Years a Member _____

Name of Beekeepers Association: _____

Are you registered with Florida Department of Agriculture and Consumer Services/Division of Plant Industry (FDACS/DPI): ____ Yes ____ No ____ N/A If yes, please provide proof.

Are you current with any and all special inspection fees: ____ Yes ____ No ____ N/A. If yes, please provide proof.

Do you follow all recommended Best Management Practices from FDACS/DPI?: ____ Yes ____ No

If no, then please explain on a separate piece of paper.

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Please provide below a chronological history of your beekeeping experience. If you need more space, please provide additional sheets:

References: If a new apiary contractor, please provide on a separate piece of paper at least 3 references who can verify your apiary experience. Provide each reference's name, address, phone number and email address (if applicable). Please attach reference sheet to this document and submit.

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MISSION STATEMENT

**Management
Of
Florida Fish and Wildlife Conservation Commission's
Wildlife Management Areas
And
Wildlife and Environmental Areas**

The mission of the Florida Fish and Wildlife Conservation Commission (FWC) is to manage fish and wildlife resources for their long-term well-being and the benefit of the people. To aid in accomplishing this mission, one of FWC's management goals is to manage fire-adapted natural communities on our Wildlife Management and Environmental Areas (WMA/WEA) to support healthy populations of the plants and animal's characteristic of each natural community. In order to achieve this goal various habitat management techniques are used. These include prescribed burning, applications of herbicides and mechanical treatment of vegetation. These management efforts will take place at various times and locations on each of the FWC's WMA/WEAs. Staff on each WMA/WEA will work with and make users aware of these activities when necessary. Users must be aware and accept that these activities are necessary for the proper management of the area.

Note: This document is included as an attachment with each Application and executed Contract.

FDACS/DPI's BMP

Florida Department of Agriculture & Consumer Services

BEST MANAGEMENT PRACTICES FOR

MAINTAINING EUROPEAN HONEY BEE COLONIES

1. Beekeepers will maintain a valid registration with the Florida Department of Agriculture and Consumer Services/Division of Plant Industry (FDACS/DPI), and be current with any and all special inspection fees.
2. A Florida apiary may be deemed as European Honey Bee with a minimum 10% random survey of colonies using the FABIS (Fast African Bee Identification System) and/or the computer-assisted morphometric procedure (i.e., Universal system for the detection of Africanized Honey Bees (AHB) (USDA-ID) or other approved methods by FDACS on a yearly basis or as requested.
3. Honey bee colony divisions or splits should be queened with production queens or queen cells from EHB breeder queens following Florida's Best Management Practices.
4. Florida beekeepers are discouraged from collecting swarms that cannot be immediately re-queened from EHB queen producers.
5. Florida Beekeepers should practice good swarm-prevention techniques to prevent an abundance of virgin queens and their ready mating with available AHB drones that carry the defensive trait.
6. Maintain all EHB colonies in a strong, healthy, populous condition to discourage usurpation (take over) swarms of AHB.
7. Do not allow any weak or empty colonies to exist in an Apiary, as they may be attractive to AHB swarms.
8. Recommend re-queening with European stock every six months unless using marked or clipped queens and having in possession a bill of sale from an EHB Queen Producer.
9. Immediately re-queen with a European Queen if previously installed clipped or marked queen is found missing.
10. Maintain one European drone source colony (250 square inches of drone comb) for every 10 colonies in order to reduce supercedure queens mating with AHB drones.
11. To protect public safety and reduce beekeeping liability, do not site apiaries in proximity of tethered or confined animals, students, the elderly, general public, drivers on public roadways, or visitors where this may have a higher likelihood of occurring.
12. Treat all honey bees with respect.

RANDOM
SELECTION PROCESS
FOR VACANT APIARY SITE

When an apiary site becomes available the following procedure is used to randomly select the next apiarist (beekeeper) for an available apiary site on a WMA or WEA. Only those who have been evaluated and deemed qualified to be an apiarist on a WMA/WEA through the Apiary Application process will be eligible for this selection process. The steps below will be followed by the THCR Contract Manager when a site becomes available to be filled by a qualified apiarist:

1. The THCR Contract Manager will maintain an “Apiary Wait List Folder” on the THCR SharePoint for each WMA/WEA with apiary sites.
2. A wait list is either created or updated when an Apiary Application(s) is received by the THCR Contract Manager from a qualified apiarist.
3. Upon receipt of an apiary site application, the THCR Contract Manager will review the WMA/WEA folder to see if there is an “Apiary Wait List”.
4. If a list exists then the qualified applicant will be added to the list.
5. When an apiary site becomes available if there are more than one qualified apiarist then these apiarists will be contacted by certified letter to determine their interest.
6. The letter will request a response within 10 working days to make them eligible for the random drawing.
7. If there is no response or is negative then that apiarist will not be included in the random drawing and the name will be removed from the waiting list*.
8. If only one apiarist responds positively to the certified letter then the available site will be awarded to that interested apiarist.
9. If there are no apiarists on a wait list or all responses are negative then apiarists who currently have site(s) under Agreement and where not on the waiting list will be contacted to see if any have interest in the available site. If more than one responds then the random drawing process will be used to determine who will be awarded the site.

10. Steps to be performed by the THCR Contract Manager to execute the random selection for an available apiary site are listed below:

- a. The names of each interested apiarist will be noted on a 1" X 2" piece of paper and folded in half.
- b. The pieces of paper will be inserted into a "black film canister" which has a snap top and placed into a container and stirred up prior to the selection.
- c. A non-biased person will be selected to reach into the bowl (which will be held above the selection person's eyesight) and randomly select one of the canisters.
- d. The canister will be opened by the person performing the selection and the name is read aloud for those in attendance. Everyone in attendance will sign a witness sheet.
- e. The apiarist whose name is selected will be awarded the available site.
- f. A new Agreement will be developed by the THCR Contract Manager.

*A new apiary application must be submitted once requestor's name is removed from a waiting list.

13.8 Management Procedures Guidelines - Management of Archaeological and Historical Resources

Management Procedures for Archaeological and Historical Sites and Properties on
State-Owned or Controlled Properties
(revised March 2013)

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. General Discussion

Historic resources are both archaeological sites and historic structures. Per Chapter 267, Florida Statutes, *‘Historic property’ or ‘historic resource’ means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state.’*

B. Agency Responsibilities

Per State Policy relative to historic properties, state agencies of the executive branch must allow the Division of Historical Resources (Division) the opportunity to comment on any undertakings, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the project, permit, grant, etc.

State agencies shall preserve the historic resources which are owned or controlled by the agency.

Regarding proposed demolition or substantial alterations of historic properties, consultation with the Division must occur, and alternatives to demolition must be considered.

State agencies must consult with Division to establish a program to location, inventory and evaluate all historic properties under ownership or controlled by the agency.

C. Statutory Authority

Statutory Authority and more in depth information can be found at:

<http://www.flheritage.com/preservation/compliance/guidelines.cfm>

D. Management Implementation

Even though the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual. Specific information regarding individual projects must be submitted to the Division for review and recommendations.

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. Recommendations may include, but are not limited to: approval of the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions, exterior alteration, or related new construction regarding historic structures must also be submitted to the Division of Historical Resources for review and comment by the Division's architects. Projects involving structures fifty years of age or older, must be submitted to this agency for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant. These must be evaluated on a case by case basis.

Adverse impacts to significant sites, either archaeological sites or historic buildings, must be avoided. Furthermore, managers of state property should make preparations for locating and evaluating historic resources, both archaeological sites and historic structures.

E. Minimum Review Documentation Requirements

In order to have a proposed project reviewed by the Division, certain information must be submitted for comments and recommendations. The minimum review documentation requirements can be found at:

http://www.flheritage.com/preservation/compliance/docs/minimum_review_documentation_requirements.pdf.

* * *

Questions relating to the treatment of archaeological and historic resources on state lands should be directed to:

Deena S. Woodward
Division of Historical Resources
Bureau of Historic Preservation

Compliance and Review Section
R. A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

Phone: (850) 245-6425
Toll Free: (800) 847-7278
Fax: (850) 245-6435

13.9 Arthropod Control Plan



Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

ARTHROPOD MANAGEMENT PLAN - PUBLIC LANDS

ADAM H. PUTNAM
COMMISSIONER

Section 389.4111, F.S.
Telephone: (850) 617-7997

For use in documenting an Arthropod Control Pan for lands designated by the State of Florida or any political subdivision thereof as being environmentally sensitive and biologically highly productive therein. Fill this form out if control work is necessary or planned.

Name of Designated Land:
Lake Wales Ridge Wildlife and Environmental Area

Is Control Work Necessary: Yes No

Location:
Highlands and Polk Counties

Land Management Agency:
Florida Fish and Wildlife Conservation Commission

Are Arthropod Surveillance Activities Necessary? Yes No
If "Yes", please explain:

Which Surveillance Techniques Are Proposed?
Please Check All That Apply:

- Landing Rate Counts
- Light Traps
- Sentinel Chickens
- Citizen Complaints
- Larval Dips
- Other

If "Other", please explain:
None

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Arthropod Species for Which Control is Proposed:
N/A

Proposed Larval Control:

Proposed larval monitoring procedure:

Are post treatment counts being obtained: Yes No

Biological Control of Larvae:

Might predacious fish be stocked: Yes No

Other biological controls that might be used:

None

Material to be Used for Larvaciding Applications:

(Please Check All That Apply)

Bti

Bs

Methoprene

Non-Petroleum Surface Film

Other, please specify:

Please specify the following for each larvacide:

Chemical or Common name:

Ground Aerial

Rate of application:

Method of application:

Proposed Adult Mosquito Control:

Aerial adulticiding Yes No

Ground adulticiding Yes No

Please specify the following for each adulticide:

Chemical or common name:

Rate of application:

Method of application:

Proposed Modifications for Public Health Emergency Control: Arthropod control agency may request special exception to this plan during a threat to public or animal health declared by State Health Officer or Commissioner of Agriculture.

Proposed Notification Procedure for Control Activities:

Records:

Are records being kept in accordance with Chapter 388, F.S.:

Yes No

Records Location:

How long are records maintained:

Vegetation Modification:

What trimming or altering of vegetation to conduct surveillance or treatment is proposed?
N/A

Proposed Land Modifications:

Is any land modification, i.e., rotary ditching, proposed:
No

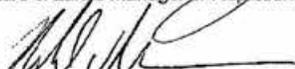
Include proposed operational schedules for water fluctuations:
N/A

List any periodic restrictions, as applicable, for example peak fish spawning times.
N/A

Proposed Modification of Aquatic Vegetation:
N/A

Land Manager Comments:
There is no need to control arthropods at the Lake Wales Ridge Wildlife and Environmental Area.

Arthropod Control Agency Comments:

	9/24/2014
Signature of Lands Manager or Representative	Date
	9/24/2014
Signature of Mosquito Control Director / Manager	Date

13.10 WCPR Strategy

Lake Wales Ridge Wildlife and Environmental Area Species Management Strategy

April 2012

Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Terrestrial Habitat Conservation and Restoration Section
A product of the Wildlife Conservation,
Prioritization and Recovery Program



Executive Summary

The Florida Fish and Wildlife Conservation Commission's (FWC) Terrestrial Habitat Conservation and Restoration section (THCR) takes a proactive, science-based approach to species management on lands in the Wildlife Management Area system (WMA/WEA). This approach uses information from statewide models, in conjunction with input from species experts and people knowledgeable about the area, to create site-specific wildlife assessments of a number of focal species. Staff combines these assessments with management considerations to develop a wildlife management strategy for the area. The FWC intends for this Strategy to: 1) Provide land managers with information on actions that should be taken provided the necessary resources are available, 2) Promote the presence of and ensure the persistence of focal wildlife species on the area, and 3) Provide measurable species objectives that can be used to evaluate the success of wildlife management on the area.

This document presents the results of a science-based process for evaluating focal species needs using an ecosystem management approach on the Lake Wales Ridge Wildlife and Environmental Area (LWRWEA). Natural community management focused on a set of focal species benefits a host of species reliant upon the same natural communities. Monitoring select species verifies whether natural community management is having the desired effect on wildlife. Throughout the process, the role of the area in regional and statewide conservation initiatives was considered to maximize the potential benefit.

[Section 1](#) informs the reader about the process used to generate this document.

[Section 2](#) describes the historic and ongoing management actions on the property.

[Section 3](#) provides a list of the focal and listed species on the area, and an assessment of each species' level of opportunity and need. This includes species-specific objectives that were identified for the American swallow-tailed kite, Bachman's sparrow, southeastern American kestrel, and rare plants.

[Section 4](#) describes specific land management actions recommended for focal species. Staff identified the need for a black bear population sub-center protection Strategic Management Areas (SMA), and recommended a change to Objective-Based Vegetation Management (OBVM) considerations for basal area in scrubby flatwoods. This section also discusses management considerations necessary to ensure continued persistence of focal species.

[Section 5](#) describes species-specific management and monitoring that is prescribed for the area, and identifies any research that would be necessary to guide future management efforts. For this area, we discuss species management for the swallow-tailed kite, scrub-jay, and southeastern American kestrel. The monitoring that is recommended is for the gopher frog, Bachman's sparrow, scrub-jay, and southeastern American kestrel. Opportunistic documentation of encounters with other focal species is recommended.

[Section 6](#) identifies coordination that will assist in conserving these focal species. We identify coordination with 9 other units in FWC and inter-agency coordination with 14 other entities.

[Section 7](#) describes efforts that are prescribed to occur "beyond the area's boundaries" to ensure conservation of the species on the area.

Continuation of current resource levels would be required to provide for most of the land management recommended in this document. Additional resources may be required to significantly influence select LWRWEA megaparcels tracts. Some of the monitoring recommendations may require additional resources, while FWC can accomplish others with continuation of existing resources.

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Acronym List

ABS	Archbold Biological Station
AHREs	Aquatic Habitat Restoration/Enhancement Subsection
APAFR	Avon Park Air Force Range
ARCI	Avian Research and Conservation Institute
CNA	Core Nesting Area
CPS	Conservation Planning Services (section; formerly Habitat Conservation Scientific Services)
CR	County Road
DEP	Florida Department of Environmental Protection
DFC(s)	Desired Future Condition(s)
EHNWR	Everglades Headwaters National Wildlife Refuge
FBC	Florida Bat Conservancy
FFS	Florida Forestry Service (formerly Division of Forestry)
FNAI	Florida Natural Areas Inventory
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Fish and Wildlife Research Institute
GHBMU	Glades Highlands Bear Management Unit
KPPSP	Kissimmee Prairie Preserve State Park
LIWG	Lake Istokpoga Working Group
LJWSSP	Lake-June-in-Winter Scrub State Park
LWREWG	Lake Wales Ridge Ecosystem Working Group
LWRNWR	Lake Wales Ridge National Wildlife Refuge
LWRSF	Lake Wales Ridge State Forest
LWRWEA	Lake Wales Ridge Wildlife and Environmental Area
MU	Management Unit (a specific piece of ground identified by a unique identifier as used in OBVM)
OBVM	Objective Based Vegetation Management
PLCP	Public Lands Conservation Planning (project)
PVA	Population Viability Analysis
SamP	Survey and Monitoring Protocol database
SCP	Species Conservation Planning (section)
SGCN	Species of Greatest Conservation Need
SHCA	Strategic Habitat Conservation Area
SMA	Strategic Management Area
SR	State Road
SWFWMD	Southwest Florida Water Management District
THCR	Terrestrial Habitat Conservation and Restoration (section)
TNC	The Nature Conservancy
USFWS	United States Fish and Wildlife Service
WCPR	Wildlife Conservation Prioritization and Recovery
WEA	Wildlife and Environmental Area
WMA	Wildlife Management Area

Statewide Species Prioritization Parameters

This table provides the values for the 6 prioritization parameters for the focal species. Parameters that are “triggered” (exceed the threshold) are in **bold**. Typically, the more parameters a species triggers, the higher the statewide prioritization.

Species Common Name	Millsap Report, 2008		Legacy Initiative		PVA on managed lands	
	Bio- logical Score ¹	Supple- mental Score ²	Popu- lation Status ³	Popu- lation Trends ⁴	Proba- bility of a 50% decline ⁵	Populations persisting (to 80 or 100 years) ⁶
American Swallow-Tailed Kite	25.7	13	low	unk	20%	50% (to 100)
Short-Tailed Hawk	30.6	15	low	unk	61%	50% (to 100)
Southern Bald Eagle	21.3	10	med	inc	0	100% (to 100)
Cooper's Hawk	15.0	12	not a SGCN	not a SGCN	96%	100% (to 100)
Florida Panther	40.3	15	low	unk	0	100% (to 100)
Florida Black Bear	32.7	13	med	stbl	5%	100% to (100)
Florida Sandhill Crane	27.0	16	med	decl	0	33 % (to 80)
Wading Birds	var	var	var	var	0	100% (to 100)
Snail Kite	50.0	17	low	decl	0	100% (to 100)
Limpkin	24.3	14	med	unk	0	100% (to 100)
Florida Mottled Duck	17.3	18	med	decl	1%	100% (to 100)
Florida Mouse	22.0	19	med	decl	74% (in 83 yrs)	17% (to 65)
Gopher Tortoise	27.3	17	med	decl	0	55% (to 100)
Gopher Frog	24.6	12	med	decl	0	9% (to 80)
Florida Scrub Jay	36.6	19	low	decl	30%	2% (to 80)
Sand Skink	35.6	20	med	decl	12%	45% (to 100)
Blue Tail Mole Skink	32.3	17	med	decl	0	72% (to 80)

Species Common Name	Millsap Report, 2008		Legacy Initiative		PVA on managed lands	
	Bio-logical Score ¹	Supple-mental Score ²	Popu-lation Status ³	Popu-lation Trends ⁴	Proba-bility of a 50% decline ⁵	Populations persisting (to 80 or 100 years) ⁶
Bachman's Sparrow	16.0	12	med	decl	0	49% (to 80)
Southeastern American Kestrel	28.0	14	low	decl	0	67% (to 100)
Sherman's Fox Squirrel	24.0	17	low	decl	0	28% (to 80)
Northern Bobwhite	11.0	14	low	decl	0	100% (to 100)
Brown Headed Nuthatch	17.0	13	med	decl	0	25% (to 80)
Eastern Indigo Snake	24.7	21	low	decl	NA	NA
Florida Pinesnake	23.7	15	med	decl	0	31% (to 80)
Audubon's Crested Caracara	37.7	17	low	unk	0	100% (to 100)
Burrowing Owl	15.3	15	med	unk	>90%	6% (to 100)
Red-Cockaded Woodpecker	27.6	14	low	decl	0	45% (to 100)
Florida Grasshopper Sparrow	39.7	18	low	decl	100%	12% (to 100)

1 Species trigger this parameter if the score is ≥ 25.9

2 Species trigger this parameter if the score is ≥ 15

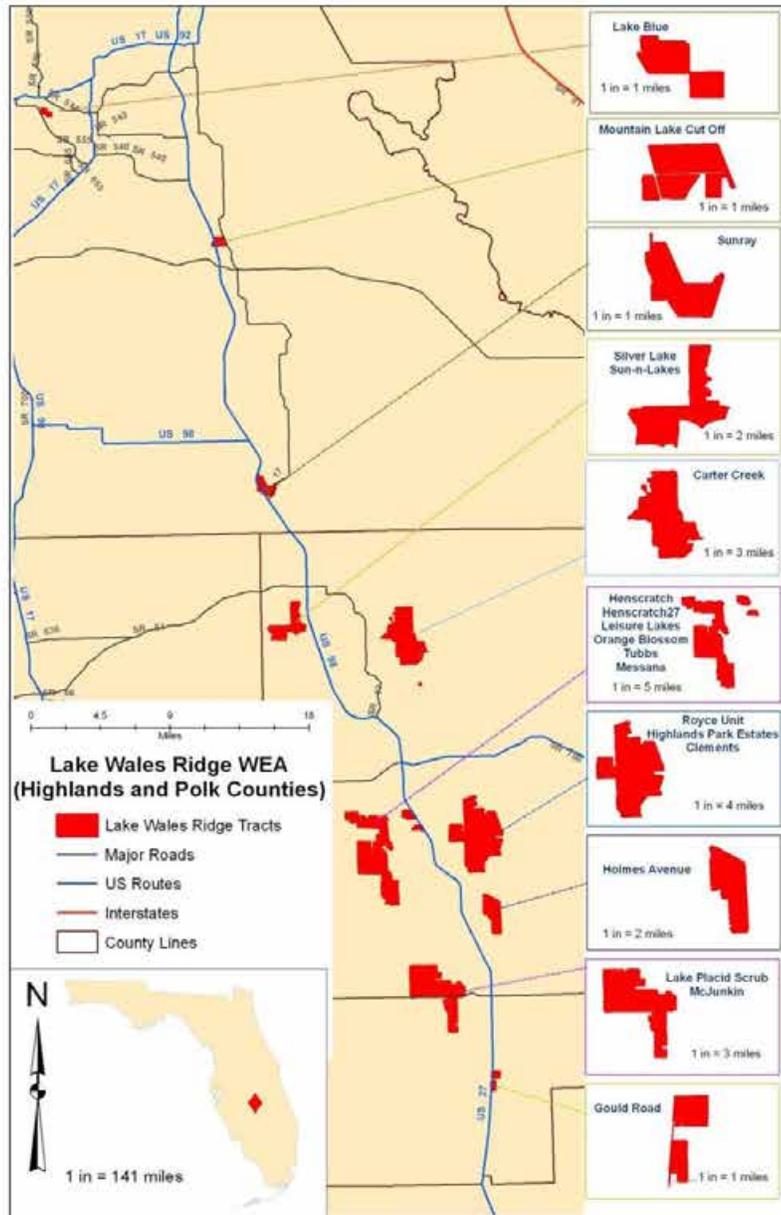
3 Species trigger this parameter if the score is \geq low or unknown (unk)

4 Species trigger this parameter if the score is \geq declining (decl) or unknown (unk)

5 Species trigger this parameter if the score is > 0

6 Species trigger this parameter if the score is $\leq 75\%$

Locator Map



Section 1: Introduction

The FWC takes a proactive, science-informed approach to species management on lands in the WMA/WEA system. Staff integrates conservation planning, Population Viability Analysis (PVA) results, and geospatial analytical techniques to model potential habitat for FWC focal species conservation. We then combine the landscape level assessments with input from species experts and people with knowledge of the area to create site-specific wildlife assessments for a number of focal species. Finally, staff combines these assessments with management considerations to develop a wildlife management strategy for the area or WMA complex.

The FWC intends for this Strategy to: 1) provide land managers with information on actions that should be taken provided the necessary resources are available, 2) promote the presence and facilitate the persistence of focal wildlife species on the area, and 3) provide measurable species objectives that can be used to evaluate the success of wildlife management on the area. Staff considers the goals and objectives included in the Management Plan (formerly known as Conceptual Management Plan) when discussing and assessing the species; therefore, this Strategy will help guide and support the goals of the Management Plan. The species-specific objectives identified in this Strategy will be incorporated into the Management Plan and this Strategy will be appended to the Management Plan.

In this document, we define goals, objectives and strategies as follows: Goals are broad statements of a condition or accomplishment to be achieved; goals may be unattainable, but provide direction and inspiration. Objectives are a measurable, time-specific statement of results responding to pre-established goals. Strategies are the actions that will be taken to accomplish a goal or objective.

Staff uses species-specific habitat models to create statewide potential habitat maps. A GIS analysis was conducted to determine which of the focal species were modeled to have potential habitat on each area. We use local staff knowledge, species-expert knowledge, and area-specific maps of natural communities to refine habitat information for each species and evaluate the area's potential role in conservation of the species. A workshop is conducted at which all individuals involved in the decision making process discuss the focal species status, evaluate opportunities for land and species management on the area, and decide on appropriate monitoring and/or research actions. Some species cannot be expected to persist on an area based solely on area-specific measures; therefore, this strategy identifies intra- and interagency coordination, and any "beyond the boundary" considerations (e.g., working with neighboring landowners) necessary for the management of focal species. Area-specific species objectives, a list of necessary actions to achieve these objectives, and the monitoring necessary to verify progress towards objectives are agreed upon and used to create the area's Strategy.

The primary focus of this approach is non-game species; however, 2 of the focal species are game birds. Specific game management actions are not included in this Strategy, though game management actions are considered when drafting the Strategy and are compatible with the actions prescribed by this Strategy. While this Strategy focuses on the LWRWEA, it considers the role of the area within the larger state or regional context. Similarly, while the Strategy has species-specific objectives and actions, it does not endorse single-species management. The FWC's land management focuses on natural community

management that benefits the host of species that naturally occur in each natural community. However, some species may need directed actions to recover from past declines, or to be restored to formerly occupied habitat. By implementing the Strategy, FWC believes our management will keep common species common, aid in the recovery of listed species, and benefit the largest suite of native wildlife.

Section 2: Current and Historic Management on Lake Wales Ridge Wildlife and Environmental Area

2.1: Location, Acquisition, and Influences on Current Condition

The FWC is the lead managing agency at the LWRWEA. The LWRWEA, located in Polk and Highlands counties, consists of 19 individual tracts scattered along 75 miles of the Lake Wales Ridge from Auburndale to Venus ([Locator Map](#)). The Lake Blue tract of the LWRWEA is actually located on the Winter Haven Ridge, not the Lake Wales Ridge. The Lake Wales Ridge ecosystem is highly imperiled because approximately 85% of its historic scrub and sandhill habitats have been converted to development and agriculture. Using funds from the Conservation and Recreation Lands and Florida Forever programs, the State began purchasing LWRWEA tracts in the 1990s. The high number of critically imperiled species on the Lake Wales Ridge led to the establishment of LWRWEA. The Florida Forever Lake Wales Ridge Ecosystem project was designed to protect the best remaining tracts of unique ridge scrub and the ecosystems associated with it. This project provides the opportunity for management to preserve examples of the unique Lake Wales Ridge landscape and the numerous endangered species associated with this landscape.

The LWRWEA boundary encompasses approximately 21,000 acres but FWC has management authority only on approximately 15,642 acres. Twelve tracts are owned in their entirety, comprising 8,628 acres. Seven tracts are partially owned and are referred to as **megaparcels**. Megaparcels are tracts of land that were divided into lots and platted as subdivisions in the 1970s and 80s. Lot size varies between megaparcels, but most lots are 1 acre or smaller. Developers sold lots to investors from all over the world, but development was slow to occur. Because of this, there are patches of degraded but intact scrub and sandhill that remain; however, the patchwork of ownership makes acquisition of significant acreage difficult and complicates the application of management. There is considerable variations in the level of infrastructure (roads and power lines) and residential housing in the different megaparcels. LWRWEA megaparcels boundaries encompass approximately 12,432 acres. To date, the State has acquired approximately 6,675 acres within the megaparcels. The remaining acreage is in private ownership or consists of roads and road rights-of-way.

The State continues to acquire parcels in the megaparcels, but acquisition is a slow and challenging process. The Florida Department of Environmental Protection (DEP) Division of State Lands has been working to acquire the remaining private lots within LWRWEA. During FY 2009-10, DEP negotiated the purchase of 4 lots (4.39 acres total) from 4 different landowners. This acreage is negligible when compared with the amount not in State ownership. At the current rate of acquisition, it will take more than 100 years to complete necessary acquisitions within LWRWEA megaparcels. In 2010, FWC collaborated with Highlands County to apply for a Federal Land Acquisition grant to acquire 32 parcels at the Carter Creek megaparcels. Unfortunately, the project did not meet the ranking criteria and

the grant was not awarded. However, FWC is open to opportunities for partnerships to affect land acquisition on LWRWEA. The continued development of private lots within megaparcels and the lack of acquisition will only increase the difficulty in managing megaparcels for the benefit of imperiled species.

Managing the LWRWEA megaparcels is challenging given the mosaic of conservation lands, private lands, roads and rights-of-ways. This mosaic of ownership makes the posting of public lands and enforcement of trespassing and other illegal activities difficult. The checkerboard pattern of ownership within megaparcels significantly affects the ability of FWC to apply effective management. Whether it occurs on the perimeter or within the tract, most megaparcels have some degree of residential development, which further complicates management.

Past land uses on LWRWEA included grazing, citrus production, and other agricultural uses. Hydrologic alterations such as drainage ditches and canals are present on some tracts. Fire suppression has resulted in most of the habitats in this area being overgrown and highly degraded. Illegal activities such as target shooting, poaching, off-road vehicle (ORV) use, and trash dumping are common and have caused degradation to the landscape and disturbance of wildlife. If the LWRWEA is to fulfill its role of preserving the unique Lake Wales Ridge landscape and the numerous endangered species associated with this landscape, most of the acres acquired by the State will need active management to restore the form and function of the natural communities.

2.2: Description of Tracts

Given the unique geographic distribution of LWRWEA tracts, it is necessary to consider each tract or group of connected tracts separately when evaluating species' potential habitat, land management activities, and role in the regional context. The next several paragraphs describe and provide a short summary of the important information for each tract, starting with the northernmost and moving south. Some tracts sharing boundaries are described as a group. The [Locator Map](#) is a visual aid in understanding the arrangement of LWRWEA tracts on the landscape of the Lake Wales Ridge.

Lake Blue (79 acres) was acquired in 2001. It is a remnant piece of scrub on the Winter Haven Ridge near Auburndale and is nearly surrounded by residential and industrial areas. A surprising number of endemic plants, animals, and invertebrates occur on this tract despite its geographic isolation from other natural areas. Exotic plant species and illegal activities are common, and proximity to residential and industrial areas influences land management opportunities. Furthermore, the distance from Lake Blue to LWRWEA field office at Royce Unit adds considerable travel time for staff. A [Ridge Ranger](#) volunteer serves as a Land Steward on this tract.

The condition of Lake Blue's upland natural communities at acquisition indicated considerable time since fire. The lack of management prior to State acquisition allowed for unsafe fuel accumulation that prevented safe application of prescribed fire. In 2008, much of the western portion of Lake Blue received mechanical treatments using a Gyrotrac. Since the mechanical treatment, some acreage burning and several large pile burns have been conducted. Lake Blue is also the site of a re-introduction of the federally listed scrub lupine (*Lupinus aridorum*). This plant has been re-introduced and is being monitored and

maintained through the Rare Plant Conservation Program at Bok Tower Gardens. To the surprise of those involved, in addition to the re-introduction, several scrub lupine plants germinated from the seed bank following acreage burning. Archbold Biological Station (ABS) monitors the effects of management treatments on rare plants at Lake Blue.

Mountain Lake Cutoff (208 acres), in Lake Wales, was acquired in 2003. Mountain Lake Cutoff contains a mix of sandhill and scrub interspersed with significantly altered areas and power lines. A school and residential area occurs along the southern boundary of the property and US 27 abuts the western boundary. Twenty-five acres are located west of US 27. These features complicate prescribed fire activities and other land management efforts. Exotic plants are a problem at this site, as are feral cats.

The condition of Mountain Lake Cutoff's upland natural communities at acquisition indicated considerable time since fire. In 2009, The Nature Conservancy's (TNC) Central Florida Ecosystem Restoration Team (commonly referred to as the Fire Strike Team) conducted a hardwood-control treatment on oaks in a sandhill near the northwest corner of the tract. FWC has worked with a burn contractor and the Florida Forest Service (FFS; formerly the Division of Forestry) to plan prescribed fires in the areas treated by TNC. FWC has been preparing burn units across the tract; however, the proximity of the tract to US 27, an elementary school, and residential development, requires that prescribed burns only affect a few acres at a time. This hampers efforts to restore larger acreage.

Sunray (419 acres) was acquired from 2000-2003, has a railroad track on the eastern boundary, and is located along US 27 between Frostproof and Avon Park. Sunray has scrub and sandhill habitats, as well as ruderal areas of citrus and pasture. The condition of upland habitat on Sunray varies across the tract. High fuel loads and a thick pine needle layer combined with the area's proximity to a major roadway are challenges to management. To help reduce fuel loads, staff applied a sand pine harvest on approximately 65 acres in 2004. In 2010, FWC applied prescribed fire to 22 acres of this tract, and in 2011, FWC and a burn contractor continued restoration on Sunray with 3 burns totaling 124 acres.

Polk County is working with the U.S. Fish and Wildlife Service (USFWS) to mitigate the loss of sand skink habitat for expansion of a county water treatment facility. This resulted in the County purchasing the 20-acre citrus grove adjacent to the north boundary of Sunray. The County has contract with The Natives, a company specializing in ground cover restoration (GCR) to affect restoration of this 20-acre mitigation project. Once restoration is complete, the plan is for these 20 acres to be added to the LWRWEA.

Silver Lake (909 acres) and **Sun-n-Lakes** (426 acres total/282 acres State-owned) are contiguous tracts located north of Sebring. The State acquired Silver Lake in its entirety in 1997, and acquisition in the Sun-n-Lakes [megaparcels](#) began in 1997. Mesic flatwoods, scrubby flatwoods and scrub are the dominant natural communities on these tracts, with several interspersed depression marshes. The western portion of Sun-n-Lakes has a large bayhead surrounded by wet flatwoods. The northern third of Silver Lake has a large sandhill, surrounded by flatwoods and scrub.

Silver Lake has 2 housing developments and a citrus grove on the east boundary and US 27 is 0.5 mile east of the tract. A non-LWRWEA megaparcels west of Silver Lake has scattered housing. North of Silver Lake is private ranchland, and the Avon Park Executive

Airport is approximately 3 miles northwest. A lack of regular fire prior to State acquisition created a condition of extensive shrub and hardwood encroachment that limited groundcover and prevented safe use of prescribed fire. Staff used a Gyrotrac to control excessive hardwoods in overgrown sandhill in MUs on the northern part of the tract to aid restoration efforts. Staff delineated management units (MUs) and applied fire across much of the tract at least once since acquisition. Groundcover has responded positively to these treatments, and overall, the habitat is in good condition.

Sun-n-Lakes is immediately south of Silver Lake and has residential housing along portions of the south boundary. The area to the south of this tract is the Sun-N-Lakes neighborhood. Highlands County owns land immediately west of this megaparcels and US 27 is 0.25 miles to the east. Habitat management in Sun-n-Lakes is challenging due to the mosaic of State and private ownership. Wildfire danger is high in this area due to a history of fire suppression. In 2010, as part of the wildfire mitigation program, FFS conducted a prescribed fire on 116 acres in this megaparcels. This treatment enhanced the condition of the habitat to the benefit of wildlife.

Carter Creek (3,505 acres total/2,303 acres State-owned) is a [megaparcels](#) east of Sebring. The State initiated acquisition of this tract in 1994. Carter Creek is a diverse tract dominated by scrub and scrubby flatwoods, with sandhill on the southern portion and several depression and basin marshes throughout. The Carter Creek stream system and its associated floodplain forest bisects the property. The USFWS manages the Carter Creek Unit of the Lake Wales Ridge National Wildlife Refuge (LWRNWR) immediately south of Carter Creek. The Bass Ranch Conservation Easement is on the eastern side of Carter Creek and the Avon Park Air Force Range (APAFR) is to the northeast.

The original developer of the Carter Creek megaparcels platted and installed roads, but never paved them. The sandy roads make access by 4x4 vehicles possible across the tract. A few houses exist on the perimeter and 2 occur within the tract. This tract has a large parking area and walk-through gates that provide public access to the road system, which is used as walking trails.

The Carter Creek tract has a history that includes extensive trash dumping, 4x4 vehicle use, and drag racing. These activities caused frequent problems for law enforcement both before and after acquisition. To address the dire need for increased land management, FWC initiated actions to reduce illegal activity and increase habitat management opportunities in 2007. By working with the local county government, FWC fenced the entire tract boundary, drastically reducing illegal activities. At the same time, staff initiated an effort to contact landowners to obtain permission to apply management to private lots when managing State lots. While this effort resulted in many landowners granting this permission, not all did. FWC has created MUs and has applied prescribed fire through in-house and contract burning since 2008. Because of these efforts, potential for focal and listed species is high.

Carter Creek has a high number of imperiled species, including Florida scrub-jays (*Aphelocoma coerulescens*) and Florida ziziphus (*Ziziphus celata*). Given the mosaic of private and public lands within the megaparcels, the application of habitat management activities has been challenging. However, of all the megaparcels tracts, Carter Creek has the highest percentage of land in State ownership, and fewer private landowners with which to

interact. Therefore, of all the megaparcel, Carter Creek is the tract with the highest management potential.

The **Leisure Lakes Complex** contains several tracts located northwest of Lake Placid. Of the tracts in this complex, Florida owns all of **Henscratch 27** (197 acres), **Messana** (61 acres) and **Tubbs** (56 acres). **Orange Blossom** (189 acres/103 acres State-owned), **Henscratch** (1,282 acres total/815 acres State-owned) and **Leisure Lakes/Highlands Ridge** (3,356 acres total/1,531 acres State-owned) are [megaparcel](#)s. All of these tracts are within a few miles of US 27; Henscratch 27 and Messana are immediately adjacent to and west of US 27.

Acquisition in these tracts began with Henscratch 27 in 1995. This complex of tracts is composed of scrub and scrubby flatwoods, with pockets of wet flatwoods. Several large baygall systems occur within the complex, as do depression marshes and small seepage slopes. Other conservation lands in this area include Jack Creek, managed by Southwest Florida Water Management District (SWFWMD), Lake June in Winter Scrub State Park (LJIWSSP) and several conservation easements. These properties contribute to the amount of potential habitat available to imperiled species in this area.

Henscratch 27 contains scrub and sandhill habitats. An upland habitat research project comparing the effects of mechanical treatment, prescribed fire and a combination of the 2 treatments in scrub habitat was conducted on this site in 2001. In 2010, a hardwood control project was initiated in MUs containing overgrown sandhill along US 27. Targeted hardwoods were either girdled, herbicided and left standing, or felled with a chainsaw. To maximize the impact of this treatment, staff has prioritized these units for burning.

To date, land management activities have not been conducted on **Messana** or **Orange Blossom**. The proximity of Messana to US 27 and the mosaic of State and private ownership in Orange Blossom limit land management in these tracts. The **Tubbs** tract is small and most of the 2 treatments in scrub habitat was conducted on this site in 2001. In 2010, a hardwood control project was initiated in MUs containing overgrown sandhill along US 27. Targeted hardwoods were either girdled, herbicided and left standing, or felled with a chainsaw. To maximize the impact of this treatment, staff has prioritized these units for burning. Management options are extremely limited in the **Henscratch** and **Leisure Lakes** megaparcel because of the mosaic of State and private lots; residential development is scattered throughout these megaparcel. Staff has treated small areas with either fire or mechanical treatment, but not enough to reverse declines in habitat quality that are affecting imperiled wildlife populations. Wildfires are common in these areas, which may somewhat delay habitat degradation. As part of their wildfire in the urban interface program, the FFS conducts prescribed fire in these areas, but not enough to significantly affect habitat quality for wildlife. Given the current and future financial considerations for land acquisition, it is unlikely that enough land will be added to significantly alter the long-range outlook for these tracts. Focusing efforts on larger blocks of State-owned land near other conservation areas may be a more prudent use of time and resources.

Royce Unit (2,641 acres), **Clements** (520 acres) and **Highland Park Estates** (3,079 acres total/1,148 acres State-owned) are contiguous parcels east of Lake Placid. The LWRWEA office is located on the Royce Unit.

Royce Unit originated with the purchase of scrub in the southwest corner of Royce Ranch, a cattle ranch that the Royce family owned and managed for about 70 years. TNC purchased this small corner of scrub in 1990 and turned it over to the State in 1995. The State purchased the rest of the ranch in 2002. The Royce family installed ditches and converted about 600 acres of mesic flatwoods and seepage slope to pasture. The family

managed most of the area with fire, which is evident by the high quality habitat conditions. TNC conducted prescribed burns on most of the scrub in the original purchase within a few years of acquisition. FWC has continued land management since the State acquired the site.

Royce Unit is a very diverse site, with native scrub, scrubby flatwoods, mesic flatwoods and one of the largest cutthroat grass (*Panicum abscissum*) seeps remaining on the Lake Wales Ridge. Additionally, Lake Istokpoga, a shallow 28,000-acre lake in eastern Highlands County, shares 2.7 miles of shoreline with Royce Unit and has 2 islands, Bumble Bee (18 acres) and Big Island (100 acres), as well as several unnamed spoil islands. The proximity of this lake to the Royce Unit provides enhanced opportunities for many of the area's focal species.

In 2006-07, a timber harvest was conducted in wet flatwoods and cutthroat areas, with prescribed fire applied within a year on most of the harvest areas. The effects of the timber harvest and prescribed fire on the cutthroat grass were beneficial. In 2008, a major hydrologic restoration effort restored the 150-acre Peace Pond from an improved pasture to a native herbaceous wetland. Two ongoing GCR projects at Royce Unit seek to restore native mesic and scrubby flatwoods in what was a bahiagrass (*Paspalum notatum*) pasture. Approximately 200 acres of citrus grove are leased to the Institute of Food and Agricultural Sciences at the University of Florida through 2045.

Clements was acquired in 1997. This tract is located immediately west of Royce Unit, with a railroad track separating the tracts. Clements contains scrubby flatwoods, mesic flatwoods, and bayhead. Though a relatively small tract, Clements is heavily used by denning Florida black bears (*Ursus americanus floridanus*) and also supports Florida scrub-jays. Most of the upland habitat on Clements has received prescribed fire at least once since acquisition, and is considered in maintenance condition.

Highland Park Estates is a [megaparcels](#) immediately south of Royce Unit, which the State began acquiring in 1996. Scrub, scrubby flatwoods, and baygall are the dominant natural communities in this megaparcels. Roads are scattered throughout this tract along with a few houses. The mosaic of State and private ownership has made habitat management in this tract very difficult; however, Highland Park Estates is a key corridor for wildlife moving from south to north between Lake Istokpoga and US 27.

Holmes Avenue (1,096 acres total/ 492 acres State-owned) is a [megaparcels](#) in Lake Placid is a key corridor for wildlife moving from south to north on the east side of US 27, which the State began acquiring in 1996. Fortunately, there are very few roads and no structures in the interior of this tract. County Road (CR) 621 is on the northern boundary and CR 619 is along the eastern boundary. Several industrial buildings are located along the northern and northwestern edges, including the LWRWEA shop. The northern two-thirds of this tract is heavily overgrown scrub and the southern third is an old pasture. This tract is a key area for black bears and Florida scrub-jays, but management is very difficult to accomplish because of the mosaic of State and private properties. In 2006, staff burned approximately 34 acres in the northwest corner of the tract. No other burns have been conducted to date, but FWC and FFS have discussed conducting wildfire mitigation burns in some areas in the south-central portion and on the entire southern portion. Illegal activities such as trash dumping and ORV use periodically occur.

The State purchased **Lake Placid Scrub** (3,161 acres) in 1993 from a company that owns much of the platted subdivision to the north of this tract. Previous landowners created hydrologic alterations (ditching and canals) on the western portion of the tract in the early 1980s and converted 600 acres to bahiagrass pasture. The purpose of these alterations was to drain the land and improve conditions for cattle grazing. An aerial photograph from the 1940s shows a homestead near the southwest corner of the property, though the foundation of the structure is all that remains. The site is considered a cultural resource and is protected during management activities.

Lake Placid Scrub consists of mesic and scrubby flatwoods, with a large ruderal area on the northwest corner and scrub and sandhill in the middle of the eastern section of the tract. Staff has managed much of this site with prescribed fire since State acquisition. A parking area and trails are located on the eastern portion and provide hiking opportunities in the scrub and along the shoreline of the adjacent Lake Placid. State Road (SR) 70 runs along the southern boundary of this tract and is a major factor to consider when planning prescribed fire. A small, private airport is located just to the northwest of the tract and residential areas are scattered to the north. Additionally, a private model airplane club uses (via FWC permit) approximately 5 acres in the western portion of the tract, which they maintain as a cleared grassy area. A small, open-air structure and windsock are on-site.

The **McJunkin** (805 acres) tract, which is located south of SR 70 adjacent to Lake Placid Scrub, was acquired in 2002. Much of the scrub on this tract is highly disturbed from past land use, especially extensive roller chopping that was conducted by the previous landowner. Because of the roller chopping, scrub at McJunkin is very patchy with large patches of bare sand that limit fire activity. FWC has applied prescribed fire to MUs on this tract, and at least 2 wildfires have occurred since acquisition. ABS, a private research organization based in southern Highlands County, is immediately adjacent to the eastern boundary of McJunkin, and presents opportunities for collaborative land management and research opportunities between FWC and ABS.

Gould Road (193 acres) is a small, isolated tract surrounded by citrus groves along US 27 south of SR 70, which the State acquired in 1995. Gould Road is comprised of 2 separate parcels, each dominated by scrub, with a scrub conservation mitigation area in between. ABS owns the mitigation area, and will turn over management to FWC once mitigation credits are assigned. Portions of Gould Road were partially cleared in the 1980s. FWC applied prescribed fire to the southern parcel in 2002 and the northern parcel in 2007. Because standing dead pine trees sometimes limit scrub-jay use of an area, in 2007, staff used mechanical treatments following prescribed fire to reduce standing dead pine trees. The proximity of this site to US 27 is a major challenge to the use of prescribed fire. One outstanding feature of this site is that it is literally on the edge of the Lake Wales Ridge; from the eastern boundary one can see a significant topographical change as the slope drops down to the east.

2.3: Management and Monitoring Since State Acquisition

The Florida Natural Areas Inventory (FNAI) completed plant community mapping at LWRWEA as part of FWC's OBVM program (Table 1), however, historic plant community mapping was not completed. Through the OBVM workshop process, staff delineated MUs and defined the desired future conditions (DFCs) for the actively managed natural communities. Natural communities mapping was not done on Mountain Lake Cutoff, Messana, or Sunray, but these areas will be mapped in the future.

Prescribed fire is the primary management action LWRWEA staff use to restore and maintain native habitats. Prescribed fire activities require extensive planning and effort because most tracts are adjacent to major roads and residential areas. Burn units in such areas are consequently very small, which makes it difficult to burn the large number of acres necessary to achieve desired fire return intervals. Staff has delineated burn units on every tract, including megaparcel. Of the total acreage comprising LWRWEA, approximately 13,680 acres are in actively managed natural communities.

The application of prescribed fire to upland habitat mimics natural fires and creates a mosaic of burned and unburned habitat throughout the landscape. Vegetation characteristics, firing technique, and weather conditions during a prescribed burn contribute to patchiness of the burn. Depending on the vegetative characteristics of a burn unit and its condition relative to surrounding MUs, scrub patches can burn every 7-15 years, and some scrub patches can go up to 100 years between burns. Cutthroat seep is typically burned every 2-3 years to promote the persistence of this rare plant community. While it is preferable to burn sandhill and flatwoods communities on a 2-4 year basis, on LWRWEA, they are burned every 2-10 years, depending on vegetative characteristics and burn history on surrounding MUs. With continued management, fuel loads will be reduced and conditions will improve to allow for a burn frequency closer to the desired 2-4 year interval. However, because of their proximity to highways or development, some MUs can only be burned with specific wind blows direction, or if there is standing water in an adjacent wetland or bayhead; this limits staff's ability to affect the desired fire return interval.

Because of the acreage in degraded condition with unsafe fuel loads, and because of the proximity of most LWRWEA parcels to private property and highways, staff uses mechanical treatments on LWRWEA. In 2002, the USFWS awarded a grant to FWC to address hazardous fuel conditions within the wildland-urban interface. FWC used part of this grant to purchase a Gyrotrac; a machine that has a low-impact on soils and can be used for a number of activities. On LWRWEA, staff primarily uses it to prepare firelines and burn unit perimeters prior to a burn. These precautions increase the safety of the crew and reduce the chance of a fire escaping the planned burn boundary. The Gyrotrac also is used for mechanical treatment on larger areas, typically when prescribed fire is not an option or aggressive pre-treatment is needed. Because most prescribed burning on LWRWEA is within the wildland-urban interface, staff takes precautions to ensure the public safety and to facilitate the continued use of fire as a management tool on the Lake Wales Ridge.

Exotic species are a major concern on LWRWEA. Feral hogs (*Sus scrofa*) can cause considerable damage to habitats and given the ecology of feral hogs and their distribution across the landscape, control or eradication is highly unlikely. Exotic plants, including cogongrass (*Imperata cylindrica*), climbing fern (*Lygodium* spp.), and Brazilian pepper (*Schinus terebinthefolius*), are present on LWRWEA. Staff addresses this problem through

contracted herbicide treatments and in-house monitoring and maintenance treatments. A formal protocol has been developed to guide exotic plant control actions; due to the invasive nature of these species, this will be an ongoing action.

Table 1. Mapped acreage of current plant communities on LWRWEA including management status and number of focal species that use the natural community.

Community Type	Estimated Current Acreage	Actively Managed ¹	# of focal species that use the NC
Carter Creek Tract Roads	307.0		
Basin Marsh	448.6		9
Basin Swamp	60.8		8
Baygall	2,110.5		2
Blackwater Stream	4.7		0
Depression Marsh	232.6		7
Floodplain Forest	41.7		6
Floodplain Swamp	5.1		5
Hydric Hammock	102.4		5
Mesic Flatwoods	3,459.8	Yes	14
Mesic Hammock	72.7		7
Pasture	234.3		13
Improved Pasture	560.7		13
Semi-Improved Pasture	45.1		13
Semi-Improved Pasture/Restored Wetland	153.0		6
Ruderal	2,214.8		10
Sandhill	653.0	Yes	18
Sandhill Upland Lake	57.0		0
Scrub	2,491.5	Yes	11
Scrubby Flatwoods	5,601.4	Yes	14
Seepage Slope	312.1		0
Wet Flatwoods	1,473.7	Yes	7
Xeric Hammock	41.9		9
Total Acres	20,684.4²		

¹ Communities that are actively managed and monitored via the OBVM process. Other communities are managed, but not monitored via OBVM.

² This acreage is for all acres within the LWRWEA boundary, including private lots within megaparcel.

The LWRWEA is part of a larger network of conservation areas and private lands that support imperiled wildlife and natural communities. Area staff takes an active role in the Lake Wales Ridge Ecosystem Working Group (LWREWG), a collaborative effort between

federal, state, and county agencies, water management districts, universities, and other non-profit organizations. The mission of the LWREWG is to ensure the long-term protection of the native plants, animals, and natural communities of the Lake Wales Ridge.

FWC's Ridge Rangers volunteer program assists area staff in managing LWRWEA and is FWC's primary outreach and education program on the Lake Wales Ridge. The program operates regularly scheduled workdays, as well as a variety of independent activities, at LWRWEA and other conservation lands in the region. Typical work performed on workdays include maintaining the scrub lupine experimental plots at Lake Blue, removing invasive plants from State property, and working with land managers to improve conditions on public conservation lands. The Ridge Ranger Volunteer Coordinator manages the program and reports to the LWRWEA lead area biologist.

Research is a priority on the Lake Wales Ridge because it provides a fountain of knowledge from which to base conservation planning and adaptive management. ABS is a private, independent research facility whose mission is long-term ecological research with a focus on the Lake Wales Ridge. In addition to ABS, other private research organizations, many academic institutions, and FWC's Fish and Wildlife Research Institute (FWRI) have conducted research on the Lake Wales Ridge. While this document is not the appropriate source to summarize all the research that has been conducted on the Ridge or even on LWRWEA, pertinent research projects will be discussed for each species where appropriate.

The "[State of the Scrub Report](#)", a 2006 publication by ABS assessed conservation progress, management responsibilities, and land acquisition priorities for imperiled species on the Lake Wales Ridge. TNC, in conjunction with ABS and the University of Florida's GeoPlan Center, produced the [Greater Ridge Conservation Planning Tool](#) in 2008 to encourage a science-based approach to conservation and land use planning on the Lake Wales Ridge. Both efforts identified focal species for the Lake Wales Ridge and are valuable conservation planning tools. The "State of the Scrub Report" identifies 36 endemic or near-endemic focal species of plants and wildlife, including invertebrates. Four of these species are WCPR focal species addressed in this Strategy [Florida mouse (*Podomys floridanus*), bluetail mole skink (*Plestiodon [Eumeces] egregius lividus*), sand skink (*Neoseps reynoldsi*), and Florida scrub-jay]. The Greater Ridge Conservation Planning Tool identified 13 focal species; the Florida scrub lizard (*Sceloporus woodi*) was the only species identified that is not a WCPR focal species.

Recreational activities on LWRWEA include hiking, horseback riding, hunting and bird watching; though not all activities are provided on every tract. Amenities include parking facilities and hiking trails at Royce Unit and Lake Placid Scrub and parking facilities at Carter Creek, where hikers use platted sandy roads. Staff maintains 4 dove fields on the Royce Unit, where hunting opportunities include small game, wild hogs, turkey, and deer.

Past wildlife monitoring by FWC staff on LWRWEA includes multi-taxa surveys, gopher tortoise surveys, and wading bird monitoring and apple snail surveys on Lake Istokpoga. An FWC biologist developed a multi-taxa survey protocol and conducted surveys on 10 tracts (Royce, Clements, Tubbs, Henscratch 27, Gould Road, McJunkin, Lake Placid Scrub, Silver Lake, Messana, and Sunray) from 2005-2009. Staff did not survey the megaparcels because of problems associated with determining lot ownership and difficulties in preventing disturbance to trapping arrays. At a minimum, these surveys provide a species occurrence list for each surveyed tract. Area staff is working through post-processing of this

data and will work with WCPR staff to incorporate historic data into the Survey and Monitoring Protocol (SaMP) database.

In May 2008, a bat species inventory was conducted, and 5 bat species were found: Brazilian free-tailed bat (*Tadarida brasiliensis*), Eastern pipistrelle (*Perimyotis subflavus*), Evening bat (*Nycticeius humeralis*), Northern yellow bat (*Lasiurus intermedius*), and Seminole bat (*Lasiurus seminolus*). The Florida Bat Conservancy (FBC) conducted the surveys and held a workshop for staff. The FBC provided guidance in placing 8 bat houses on LWRWEA; 4 at Royce Unit and 1 bat house each at Lake Placid Scrub, Carter Creek, Mountain Lake Cutoff and Sunray. Bats periodically use these houses, which are protected during land management activities.

Ongoing monitoring by FWC staff on LWRWEA includes kestrel nest box monitoring at Royce Unit, Clements, Silver Lake, Lake Placid Scrub and Mountain Lake Cutoff ([Section 3.2.18](#)). Florida scrub-jays are monitored annually by ABS and the Jay Watch Program; FWC staff assists with this monitoring as needed ([Section 3.2.13](#)). LWRWEA staff participates in a multi-state research project aimed at developing harvest management strategies for mourning doves. Doves are captured in wire mesh traps baited with millet and then aged, sexed, and banded. Doves are trapped and banded in late summer, and band recovery data is used to estimate survival and harvest rates. Across LWRWEA, staff record opportunistic wildlife observations and maintain a species list. Other activities that may require staff's time include assisting with research projects, bear trapping, and plant surveys on LWRWEA.

Rare plants are a high priority on the Lake Wales Ridge and numerous State- and federally listed plant species occur on LWRWEA ([Table 2](#)). LWRWEA has significant cutthroat seeps on several tracts. ABS monitors rare plants on select LWRWEA tracts and provides guidance and feedback for land management activities. For more information on rare plants on LWRWEA, see [Section 3.2.25](#).

Section 3: Area Focal Species

FWC's land management focuses on restoring the natural form and function of natural communities. However, in some instances, it is important to consider the needs of specific species and to monitor the impacts of natural communities' management on select wildlife. To ensure a focused, science-informed approach to species management, FWC uses the focal species concept embraced by the [Wildlife Habitat Conservation Needs in Florida](#) project. The focal species approach incorporates a variety of concepts and considerations that, if applied correctly, allow one to identify the needs of wildlife collectively by strategically focusing on a subset of wildlife species. The species selected as focal species includes umbrella species, keystone species, habitat specialist species, and indicator species.

The Public Lands Conservation Planning (PLCP) project selected 60 focal species for the statewide assessment. The PLCP project used potential habitat models to create statewide potential habitat maps for each species. Models were created using relevant available data with the base layer for all models being the FWC's 2003 landcover data. Considering the natural history of species, staff selected additional data layers such as the species range, soils, land use, etc. As such, each model is species specific. Once statewide potential habitat maps were available, a PVA was conducted for each focal species.

Using the statewide landcover-based habitat maps, models identified 28 of the 60 focal species to have potential habitat on LWRWEA (Section 3.1). One additional species, the eastern indigo snake (*Drymarchon couperi*), was added because of its conservation importance. To create more accurate area-specific potential habitat maps, we used the same statewide model for each focal species on the area but replaced the landcover data with area-specific natural community data. The resulting potential habitat map was then refined based on the input of local managers and species experts. All potential habitat acreage estimates provided in Section 3.2 are the results of this area-specific model and resulting map.

The LWRWEA WCPR Workshop held May 25-27, 2011 brought decision makers together to assess species' opportunities and needs, determine required actions including monitoring, identify measurable objectives, and identify necessary coordination efforts. WCPR staff compiled information on the focal species in a workbook to facilitate informed discussion of the species. Participants at the workshop discussed the "level of opportunity and need" for each species. This included considering the number of statewide prioritizations the species triggered (Statewide Species Prioritization Table), the long-term security of the species (i.e., examining PVA results), if the species occurs in actively managed communities (Table 1), if the species is management responsive, and any other local overriding considerations (e.g., status of species in the region, local declines/extirpations). A brief summary of the opportunity and need assessment for each focal species is available in Section 3.2.

3.1: Lake Wales Ridge WEA Focal Species

Species that have a measurable objective are indicated with a ¹ and species for which some level of monitoring is recommended are indicated with a ². Occasionally, models indicate a species has potential habitat on the area when using statewide data; however, the local assessment indicates there is little opportunity to manage for the species on the area and the species should not influence management. These species are identified with an *.

Gopher frog (*Lithobates capito*)²

Bluetail mole skink (*Plestiodon [Eumeces] egregius lividus*)

Eastern indigo snake (*Drymarchon couperi*)

Florida pine snake (*Pituophis melanoleucus mugitus*)

Gopher tortoise (*Gopherus polyphemus*)

Sand skink (*Plestiodon [Neoseps] reynoldsi*)

American swallow-tailed kite (*Elanoides forficatus*)¹

Bachman's sparrow (*Peucaea aestivalis*)^{1,2}

Brown-headed nuthatch (*Sitta pusilla*)

Burrowing owl (*Athene cunicularia*)*

Cooper's hawk (*Accipiter cooperii*)

Crested caracara (*Caracara plancus auduboni*)*

Florida grasshopper sparrow (*Ammodramus savannarum floridanus*)*

Florida mottled duck (*Anas fulvigula*)

Florida sandhill crane (*Grus canadenses pratensis*)

Florida scrub-jay (*Aphelocoma coerulescens*)²

Limpkin (*Aramus guarauna*)
Northern bobwhite (*Colinus virginianus*)
Red-cockaded woodpecker (*Picoides borealis*)*
Short-tailed hawk (*Buteo brachyurus*)
Snail kite (*Rostrhamus sociabilis plumbeus*)
Southeastern American kestrel (*Falco sparverius paulus*)^{1,2}
Southern bald eagle (*Haliaeetus leucocephalus*)
Wading birds (Multiple species)

Florida black bear (*Ursus americanus floridanus*)
Florida mouse (*Podomys floridanus*)
Florida panther (*Felis concolor coryi*)*
Sherman's fox squirrel (*Sciurus niger shermani*)

3.2: Focal Species Opportunity/Needs Assessment

This section provides an assessment of the opportunity for management and needs of each of the focal species. Because all federally listed species are FWC-listed, we will provide only the federal listing status for federally listed species. When a species is not federally listed but is FWC-listed, we will provide the FWC listing. Unless otherwise noted, all acres of potential habitat are the result of using the area-specific natural community data in the species potential habitat model. We provide total potential habitat acreage estimates for each focal species on LWRWEA, as well as subtotals for each tract that was deemed to have a role in the conservation of that species. These estimates include all the area mapped in a natural community identified as potential habitat including patches that may not be contiguous with other suitable habitat. We considered the spatial arrangement and habitat patch size when assessing the potential of each LWRWEA tract and its role in the conservation of each species. For species that require larger habitat patches, we considered the continuity and condition of habitat on lands adjacent to the WEA. We presume that by doing the actions called for in this strategy, we will ensure the LWRWEA fulfills its role in the conservation of wildlife.

The FWC is currently in the process of developing management plans for FWC-listed species. Staff will monitor these plans to determine if the content of the plans warrants a revision to any of these assessments. Revisions will be amended to the strategy.

3.2.1: Gopher Frog

Gopher frogs have been documented on 5 LWRWEA tracts (Royce Unit, Lake Placid Scrub, McJunkin, Sun-n-Lakes and Carter Creek). Staff trapped gopher frogs at the McJunkin tract during vertebrate surveys, and incidentally observed gopher frogs at Royce Unit and Lake Placid Scrub. Gopher frog tadpoles have been found at Lake Placid Scrub, Sun-n-Lakes and Carter Creek. Gopher frog habitat is a subset of gopher tortoise habitat that contains fishless ephemeral wetlands in which gopher frogs breed. After breeding, gopher frogs move back into surrounding upland habitat within a mile of the breeding pond. They prefer native, fire-maintained xeric habitats with intact groundcover, but can persist in areas

with some habitat alteration. Gopher frogs often occupy gopher tortoise burrows, but they will use rodent and crayfish burrows, stump holes, and hollow logs.

Gopher frogs in Florida are an FWC-listed species of special concern. Considered a moderate priority statewide, this species triggers 2 of 6 prioritization parameters ([priorities table](#)). Regionally, the Lake Wales Ridge has a high amount of upland habitat that could support gopher frogs, and the species is known to occur in some areas; however, upland habitat on the Lake Wales Ridge is highly fragmented by development and agriculture. In many areas not currently managed or protected as conservation lands, ORV use in the uplands and ephemeral ponds is extensive, further reducing suitability for gopher frogs. This is often the case in megaparcel on LWRWEA.

Models indicate 5,981 acres of potential habitat for gopher frogs on LWRWEA, spread among several tracts. Royce Unit and Clements combine to have the most potential habitat (1,584 acres), and the highest diversity of habitat types used by gopher frogs. Lake Placid Scrub and McJunkin contain 937 and 482 acres of potential habitat, respectively, and McJunkin is adjacent to ABS, where gopher frogs are known to occur. Carter Creek has 427 acres and there is additional potential habitat on the adjacent USFWS property. The Silver Lake/Sun-N-Lakes complex has over 700 acres of modeled potential habitat, about half of which occurs on Silver Lake. Little is known about gopher frog home range size or how much habitat is required to sustain a population; however, it is probable that some LWRWEA tracts have enough potential habitat to support a viable population. Unfortunately, habitat contained within megaparcel is not likely to be managed appropriately in the long-term to benefit this species.

On tracts where this species has been documented, ongoing land management actions are compatible with the needs of gopher frogs. Management actions that maintain or enhance habitat for this species include the continued use of prescribed fire in scrub, sandhill, mesic flatwoods, and isolated wetlands. Ongoing efforts to maintain LWRWEA natural community structure and function will benefit this species; therefore, no SMA is required. [Section 4.3.1](#) provides additional land management recommendations to benefit gopher frogs.

In May 2011, FWC identified potential breeding ponds to survey on Carter Creek and Silver Lake/Sun-n-Lakes. Only 1 pond had sufficient water levels and gopher frog tadpoles were not found. In November 2011, staff revisited these ponds and found gopher frog tadpoles at 1 pond on Carter Creek and 1 at Sun-n-Lakes. Lake Placid Scrub also had gopher frog tadpoles in 1 pond. We recommend conducting baseline monitoring to document the presence of gopher frogs on LWRWEA using dip-net surveys or call surveys ([Section 5.2.1](#)). Accomplishing monitoring will require coordination between FWRI ([Section 6.1.4](#)), FWC's Ridge Ranger Coordinator ([Section 6.1.9](#)) and local staff. It is not appropriate to make this a measurable objective, as there are factors that may limit completion.

The area goal is to maintain habitat in suitable conditions to maintain a viable population of gopher frogs on LWRWEA. On tracts where gopher frogs have been documented and large amounts of potential gopher frog habitat occur (Royce Unit, Lake Placid Scrub and McJunkin), there is a high opportunity to conserve the gopher frog population on the Lake Wales Ridge.

3.2.2: Bluetail Mole Skink

The bluetail mole skink is an extremely rare Lake Wales Ridge endemic species, found only in Polk, Highlands and western Osceola counties. Staff found bluetail mole skinks on 5 tracts (Clements, Henscratch 27, McJunkin, Gould Road and Silver Lake) during vertebrate surveys, and Silver Lake had the highest number of bluetail mole skinks trapped. It has been incidentally observed at Lake Blue and Carter Creek. Bluetail mole skinks are found in well-drained sandy uplands. Often found 1-2 inches deep in sand under pine needles, leaves, logs or palmetto fronds, this fossorial lizard has legs that are reduced in size and not used when “swimming” through the sand. Little is known about the specific habitat requirements for this species. Leaf litter may be an important component of microhabitat and areas with loose sand and sunny exposure are preferred. Skinks prefer areas with low soil compaction, low soil moisture and larger particle sizes. Low understory vegetation cover and higher percent of bare, loose sand are important habitat components to consider when managing for this species.

The bluetail mole skink is a federally listed species that triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a high statewide priority. Additionally, the “State of the Scrub Report” identified this species as a high priority for monitoring and research, as well as land acquisition. Outside of LWRWEA, this species occurs on other managed areas along the Lake Wales Ridge, but systematic assessments of distribution or population size are lacking, mainly because of the difficulty associated with monitoring this rare fossorial lizard.

Models indicate 8,788 acres of potential bluetail mole skink habitat on LWRWEA. Silver Lake and the adjacent Sun-N-Lakes have high potential for this species (458 and 155 acres), Royce Unit and Clements contain a combined 570 acres of potential habitat. Of the total potential habitat for this species on LWRWEA, 5,866 acres (67%) are contained within [megaparcel](#)s. With the possible exception of Carter Creek (1,599 acres of potential habitat), staff are limited in their ability to affect habitat conditions at a scale that would ensure population viability for this species on the megaparcel. Development of individual private parcels is highly likely in the future, further degrading and fragmenting potential habitat for this species in the megaparcel tracts. Mechanical treatment is often the only viable option for land management on State-owned parcels within megaparcel tracts. While the effect of mechanical treatments on this species is not well understood, mechanical treatments may be detrimental to fossorial lizards.

Habitat requirements and population viability for this species are not well understood. Bluetail mole skinks do not appear to disperse well, even when surrounded by suitable, unoccupied habitat. According to the literature, they are more often found concentrated in localized pockets rather than distributed throughout suitable habitat. As such, acreage of potential habitat on a given tract may not truly reflect potential for a viable population of this species.

Where staff is applying land management in modeled bluetail mole skink potential habitat it is compatible with the needs of this species; no SMA is recommended. Prescribed fire techniques that promote patchy burns and retain open, sandy areas interspersed with areas containing shrubs and leaf litter are thought to be ideal for this species. The retention of unburned areas due to natural fire exclusion will ensure that skink habitat is always available. In skink habitat, when unburned areas occur due to natural fire exclusion, managers should not mechanically treat these patches.

Staff use mechanical treatments on LWRWEA to create and maintain firebreaks and alter the structure of vegetation prior to applying fire in MUs that are close to property boundaries, houses, and roads. Occasionally, mechanical treatment is applied to an entire MU when vegetation characteristics limit the spread of fire. To retain the patchy mosaic desired by this species and to reduce soil compaction, the use of heavy equipment should be limited in areas that are a priority for this species, and when applied, a “sloppy chop” using low-ground pressure equipment is preferred.

Research and monitoring have been identified as priorities for this species on the greater Lake Wales Ridge. Currently, there is no ongoing herpetological monitoring on LWRWEA. A USFWS protocol describes how to conduct pedestrian and coverboard surveys for sand skinks and bluetail mole skinks. However, the survey does not allow one to distinguish between the 2 species, unless individuals are found. Because sand skinks are considerably more common on LWRWEA, this type of monitoring would not provide significant information specific to the bluetail mole skink; therefore, monitoring by area staff is not recommended at this time. However, should a monitoring plan be developed that is compatible with the needs of area managers, we would encourage the monitoring on LWRWEA.

Land acquisition in the megaparcel and continued land management in these areas, where feasible, should be priorities. This will benefit not only fossorial lizards such as the skink species, but also other endemic scrub species such as Florida scrub-jay and rare plants.

The area goal is to maintain and enhance habitat in appropriate areas to continue to support bluetail mole skinks on LWRWEA. The LWRWEA is part of a greater network of conservation areas containing scrub habitat and has an opportunity to contribute to the persistence of this rare endemic species.

3.2.3: *Eastern Indigo Snake*

Eastern indigo snakes are relatively common on LWRWEA. Staff detected indigo snakes on 3 tracts during vertebrate surveys (Royce Unit, Lake Placid Scrub and Silver Lake), and has encountered the species on all tracts. Indigo snakes are known to occur on many conservation areas across the Lake Wales Ridge.

The indigo snake was added to the focal species list for LWRWEA because it is a federally listed species and triggers 3 of 4 available prioritization parameters ([priorities table](#)). Commonly associated with scrub, sandhill, and scrubby flatwoods, indigo snakes also use pine flatwoods, dry prairie, hardwood hammocks, marsh edges, and agricultural fields. Gopher tortoise burrows are important refuge sites for indigo snakes and provide protection from cold and desiccation. Indigo snakes also will use cotton rat burrows, hollowed tree stumps, ground litter, trash piles, and rock piles.

Models indicate 14,578 acres of potential habitat for indigo snakes on LWRWEA, with 8,635 acres (59%) contained within [megaparcel](#)s. The body of research for indigo snakes suggests that at least 4,000 acres of habitat are required to support a viable population. Lake Placid Scrub and McJunkin provide 3,106 acres of potential indigo snake habitat. Combined with habitat on the adjacent ABS, these tracts have a high opportunity to support an indigo snake population. Furthermore, undeveloped ranches and citrus groves surround these areas that aid in supporting the population. Royce Unit, Clements and Highland Park Estates provide almost 3,000 acres of potential indigo snake habitat, but half of the potential

habitat is in the megaparcels. The Leisure Lakes complex of tracts provides almost 4,000 acres of potential indigo snake habitat. Combined with habitat on Jack Creek, LJIWSSP and conservation easements, there is enough habitat to support a viable population. However, habitat management in this area is limited by residential development and property ownership, and the amount of roads in the area is a detriment to the species. Carter Creek contains 2,274 acres of potential indigo snake habitat. Combined with potential habitat on LWRNWR and the Bass Conservation Easement, as well as undeveloped ranchland between the tract and APAFR, Carter Creek has a high opportunity to contribute to the local indigo snake population. The remaining tracts contain potential indigo snake habitat, though not enough to independently support a viable population. Indigo snakes have large home ranges and are vulnerable to habitat fragmentation, including the loss of travel corridors between areas of suitable habitat and the increased mortality the species faces in areas with more roads. The occurrence of these features impedes the movement of indigo snakes between geographically separated LWRWEA tracts, and this has a negative influence on the species.

Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical actions that aid in restoring natural community structure and function. As ongoing management will benefit this species, there is no SMA recommended. Stumps and other coarse woody debris should be retained during land management activities as potential refuge sites ([Section 4.3.2](#)).

The Orianne Society, a non-profit reptile conservation organization began studying indigo snakes in Highlands County in Fall 2010, focusing primarily on and around ABS and LJIWSSP. The purpose of this USFWS-funded study is to describe the spatial and habitat ecology of indigo snakes on the southern Lake Wales Ridge, including LWRWEA tracts within the study area. Results from this study may add to FWC's understanding of habitat use by this species ([Section 6.14](#)).

Because there is no adequate monitoring technique available for this species, no measurable objectives have been identified. However, opportunistic monitoring is recommended ([Section 5.2.5](#)), and the results should be shared with FWRI ([Section 6.1.4](#)). While drift-fence surveys will not provide population-level information on this species, future drift-fence surveys conducted on the area should include the use of large upland snake traps to ensure adequate detection of large snakes such as the indigo or pine snake.

The area goal is to enhance and maintain the suitability of habitat to continue to support indigo snakes on LWRWEA. Larger tracts, or those with adjacent conservation lands, have a higher chance of continued presence than smaller tracts surrounded by urban and residential areas. However, even if FWC manages LWRWEA to accommodate the needs of this species, the continued presence of this species on LWRWEA is dependent on conditions that influence the regional population.

3.2.4: Florida Pine Snake

The Florida pine snake is rarely encountered on LWRWEA. To date, it has been documented on 3 tracts (Holmes Ave, Henscratch 27, and Gould Road). Staff detected Florida pine snakes on Gould Road during vertebrate surveys; otherwise, it has only been detected incidentally. While pine snakes use a number of plant communities, they typically occupy pine-dominated areas with sandy soils and a well-developed grassy understory, such as upland pine and sandhill communities. Pine snakes actively seek out and burrow into

pocket gopher mounds to capture pocket gophers, which are a major source of food for this species. On LWRWEA, the location of specific pocket gopher areas is unknown; however, the presence or absence of pocket gophers does not directly correlate to pine snake presence or absence.

The Florida pine snake triggers 3 of 6 prioritization parameters ([priorities table](#)) and is an FWC-listed species of special concern. According to the literature, pine snakes and indigo snakes have similar home range sizes, and at least 2,471 acres of suitable habitat are required to support a viable population of pine snakes. Models indicate 8,826 acres of potential habitat for Florida pine snakes on LWRWEA, with 5,058 acres (57%) are contained within [megaparceles](#). Lake Placid Scrub and McJunkin provide almost 2,000 acres of potential pine snake habitat. Combined with habitat on the adjacent ABS, these tracts have a high opportunity to support a pine snake population. Furthermore, undeveloped ranches and citrus groves surround these areas and provide habitat for the species. Royce Unit, Clements and Highland Park Estates provide almost 1,600 acres of potential pine snake habitat, but almost half is in the megaparcel. The Leisure Lakes complex of tracts provides almost 1,900 acres of potential pine snake habitat. Combined with habitat on Jack Creek, LJIWSSP and conservation easements, there is enough habitat to support a viable population. However, residential development and property ownership limits the ability to conduct habitat management in this area, and the amount of roads in the area is a detriment to the species. Carter Creek contains 1,739 acres of potential pine snake habitat. Combined with potential habitat on LWRNWR and the Bass Conservation Easement, as well as undeveloped rangeland between the tract and APAFR, Carter Creek has a high opportunity to contribute to the local pine snake population. The remaining tracts contain potential pine snake habitat, though not enough to support independently a viable population. Pine snakes have large home ranges and are vulnerable to habitat fragmentation, including the loss of travel corridors between areas of suitable habitat within a home range and the increased mortality the species faces in areas with more roads. This fragmentation likely impedes movement of pine snakes between geographically separated LWRWEA tracts.

Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical treatments that aid in restoring natural community structure and function. As ongoing management will benefit this species, there is no SMA recommended. Stumps and other coarse woody debris should be retained during land management activities ([Section 4.3.2](#)).

Because there is no adequate monitoring technique available for this species, no measurable objectives have been identified; however, opportunistic monitoring is recommended ([Section 5.2.5](#)). While drift-fence surveys will not provide population level information on pine snakes, future drift-fence surveys conducted on the area should include the use of large upland snake traps to ensure adequate detection of large snakes.

The area goal is to enhance and maintain the suitability of habitat to continue to support pine snakes on LWRWEA. Larger tracts or those with adjacent conservation lands have a higher chance of continued Florida pine snake presence than smaller tracts surrounded by urban and residential areas. However, the continued presence of this species on LWRWEA is dependent on conditions that influence the regional population.

3.2.5: Gopher Tortoise

Gopher tortoises are relatively common on the Lake Wales Ridge and are commonly observed on all LWRWEA tracts, although only a few occurrences have been documented at Lake Blue. As part of the statewide restocking initiative, the FWC assessed LWRWEA in 2007 and determined that LWRWEA did not have any areas that met the criteria for accepting translocated tortoises. In 2010, a single transect was surveyed in Carter Creek MUs 87-89 prior to a hardwood control/sandhill restoration project funded by the State Wildlife Grant Program and FWC's Gopher Tortoise Management program; one abandoned gopher tortoise burrow was found.

The gopher tortoise is a management-responsive species that can serve as an indicator of properly managed upland pine or grassland communities. It prefers xeric upland communities maintained with fire that helps perpetuate the groundcover on which it feeds. The gopher tortoise is often considered a keystone species because many other species use their burrows, including focal species such as the Florida mouse and gopher frog. This FWC-listed threatened species triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a high priority species statewide. The FWC approved a management plan that places emphasis on increasing the number of tortoises on public lands in 2007. The FWC is in the process of revising this plan with the revision scheduled to be complete in September 2012, with continued emphasis on habitat restoration on public lands.

Models indicate 9,612 acres of potential habitat for gopher tortoises on LWRWEA. There is conflicting information in the literature about the minimum requirements to sustain a population of gopher tortoises. Using the conservative estimate of 200 acres of suitable habitat, all LWRWEA tracts (or groups of tracts) have the potential to support viable gopher tortoise populations, with the exception of Mountain Lake Cutoff and Lake Blue. Although gopher tortoises have been observed at Lake Blue, the long-term potential for them to persist is low given the urbanization of the surrounding area. This is also the case at Mountain Lake Cutoff. Gould Road contains only 171 acres of potential gopher tortoise habitat. However, when combining the acres on Gould Road with habitat on the adjacent scrub mitigation bank, this area has enough potential habitat to support a viable population. Gould Road is less than a mile east of ABS, which supports a gopher tortoise population. [Megaparcel](#)s contain 5,548 acres (58%) of potential gopher tortoise habitat on the LWRWEA. Land management is challenging on megaparcel

s and, with the possible exception of Carter Creek (1,765 acres of potential habitat), achieving habitat conditions that will meet the needs of gopher tortoises is affected by factors outside the control of area staff. Excluding the megaparcel

s, a high level of opportunity exists on LWRWEA to promote habitat suitability for gopher tortoises and to increase and maintain tortoise densities on the area. Furthermore, improving and maintaining habitat for gopher tortoises will benefit a number of other wildlife species. Management actions that maintain or enhance habitat for this species include the frequent use of prescribed fire. FWC has managed much of the potential gopher tortoise habitat on the LWRWEA using prescribed fire, mechanical treatment, chemical treatment, or a combination of these treatments. Smaller tracts may have less currently suitable habitat, but gopher tortoises use these tracts in their present condition. Areas on larger tracts that are not currently suitable are not considered essential to sustaining the tortoise population; however, managing these currently unsuitable areas will increase the potential for population growth and allow LWRWEA to fulfill its role in increasing the

number of gopher tortoises on conservation lands. These areas will be treated and maintained in conjunction with current suitable habitat on LWRWEA, therefore no SMA is required. Additional land management considerations can be found in [Section 4.3.3](#).

It is not known whether monitoring gopher tortoises on LWRWEA would be appropriate. As a management-responsive species, gopher tortoise density and abundance can be an indicator that land management activities are having a positive effect; however, the geographic separation of LWRWEA tracts complicates monitoring for this species. Conducting a gopher tortoise surveys would provide information that may influence land management decisions, but conducting such a survey is currently outside the personnel and funding resources available on the LWRWEA. If additional resources become available, it would be beneficial to have a baseline survey of gopher tortoise densities on LWRWEA, with follow-up monitoring on a 5-10 year basis to track changes.

The area goal is to maintain habitat in suitable conditions to allow gopher tortoises to thrive on LWRWEA. As long as the observation of gopher tortoises continues to be common on tracts with > 200 acres of suitable habitat, the LWRWEA is meeting this goal. Applying management treatments to areas that are currently unsuitable and making these areas capable of supporting the species will allow LWRWEA to fulfill its role in increasing the number of gopher tortoises on conservation lands.

3.2.6: Sand Skink

The sand skink has been documented on every LWRWEA tract. Outside of LWRWEA, sand skink tracks are commonly observed on other managed areas along the Lake Wales Ridge. Sand skinks are fossorial lizards found in rosemary scrub, sand pine scrub, oak scrub, scrubby flatwoods, and turkey oak barrens. Sand skinks also are found in some disturbed areas, such as citrus groves, occurring on or near soils that formerly supported typical sand skink habitat. Populations can persist in disturbed areas as long as soil conditions are adequate. Low understory vegetation cover and a high percentage of bare, loose sand are important components of sand skink habitat, but conditions within the soil are more important than vegetative conditions above the soil.

The sand skink is federally listed and triggers 5 of 6 prioritization parameters ([priorities table](#)), making it a high statewide priority. Additionally, the “State of the Scrub Report” identified the sand skink as a focal species for the Lake Wales Ridge.

Models indicate 8,746 acres of potential sand skink habitat on LWRWEA, with 5,835 acres (67%) of potential sand skink habitat occurring within [megaparcels](#). All LWRWEA tracts contain potential sand skink habitat and have documented sand skink occurrence. Carter Creek, Highland Park Estates and Leisure Lakes contain the most potential sand skink habitat on LWRWEA (1,586 acres, 973 acres, and 1,694 acres, respectively), but with the possible exception of Carter Creek, area staff is limited in its ability to affect habitat conditions at a scale that would ensure population viability for sand skinks in the megaparcels. However, sand skinks tracks are common on highly disturbed tracts as well as those that have the longest history of fire management on LWRWEA. Tract size, relative amount of potential habitat, and surrounding land use may not be significant enough factors to affect sand skinks on LWRWEA during the life of this Strategy.

Land management histories vary for each tract, as does the condition of neighboring landscapes. Excepting megaparcels, prescribed fire is the primary management technique

used in potential sand skink habitat on LWRWEA. As fossorial lizards, sand skinks swim just below the surface of the sand. Prescribed fire techniques that provide patchy burns and retain open, sandy areas near unburned patches of vegetation are ideal for this species. Bare sand can impede the direct movement of fire across the landscape, thus creating a mosaic of burned and unburned habitat within a given MU. The retention of unburned areas due to natural fire exclusion will ensure that skink habitat is always available; managers should not mechanically treat these patches.

Staff uses mechanical treatments on LWRWEA to create and maintain firebreaks, and to alter the structure of vegetation prior to applying fire in MUs that are close to property boundaries, houses, and roads. Occasionally, mechanical treatment is applied to an entire MU when vegetation characteristics are expected to create unacceptable fire behavior. Given the sand skink's fossorial nature and dependence on soil conditions, soil compaction and damage from mechanical equipment could have a negative effect. To retain the patchy mosaic desired by this species and to reduce soil compaction, the use of heavy equipment should be limited in areas that are a priority for this species, and when mechanical treatments are applied, a "sloppy chop" technique using low ground-pressure equipment (e.g., a Gyrotrac) is preferred. To the extent practical, avoid widespread mechanical treatment in areas with a high density of sand skink tracks. Given the relatively common occurrence of this species within potential habitat, there are no specific management actions prescribed for sand skinks at this time; therefore, a SMA is not recommended.

Currently, there are no ongoing herpetological monitoring efforts on LWRWEA. A USFWS protocol describes how to conduct pedestrian and coverboard surveys for sand skinks and bluetail mole skinks. Monitoring by area staff is not recommended at this time because staff time and resources are limited and sand skinks are relatively common on LWRWEA. However, should a monitoring plan be developed that is compatible with the needs of area managers, we would encourage it to be used for monitoring on LWRWEA.

Research and monitoring have been identified as priorities for this species on the greater Lake Wales Ridge. Land acquisition and continued land management in the megaparcel, where feasible, should be priorities as well.

The area goal is to maintain and enhance sand skink habitat in appropriate areas to maintain their presence on LWRWEA. The LWRWEA is part of a greater network of conservation areas containing scrub habitat and has an opportunity to contribute to the persistence of this rare endemic species.

3.2.7: American Swallow-Tailed Kite

The American swallow-tailed kite is occasionally observed on LWRWEA. Nesting has not been documented, but staff report observing groups of kites near the field office at Royce Unit during the breeding season. The Avian Research and Conservation Institute (ARCI), a research organization that conducts statewide research on swallow-tailed kite and short-tailed hawk populations, surveyed the Lake Wales Ridge in 2008 and found nests of both species at several locations, though none on LWRWEA. The closest known nest to LWRWEA is on private land approximately 0.25 miles from Lake Placid Scrub. The status of this nest since the 2008 breeding season is unknown.

Swallow-tailed kites are habitat generalists and utilize a variety of natural communities on the LWRWEA. Tall trees are an important component of nesting habitat

and open areas are used for foraging. Trees that are dominant or taller than surrounding trees are preferred as nest trees. Shrub height and density tends to be higher around nest sites. Because this species has high nest site fidelity, maintaining suitability of nesting areas is important.

American swallow-tailed kites trigger 4 of 6 statewide prioritization parameters ([priorities table](#)), making them a moderate statewide priority. Regionally, kites are commonly observed during the breeding season. Nesting has been documented on or near several conservation areas, including KICCO WMA, Arbuckle WMA, and Hickory Hammock WMA. Fisheating Creek, a major pre-migration congregation site is < 10 miles south of the southern end of the Lake Wales Ridge.

Models indicate 10,815 acres of potential kite habitat spread across most tracts on LWRWEA. American swallow-tailed kites are not typically considered management-dependent and the opportunity to affect this species on LWRWEA is low. Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical actions that aid in restoring natural community structure. If nests are located on the area, management recommendations around these sites will be considered ([Section 4.3.4](#)) and the nest will be reported to ARCI ([Section 6.6](#)). If swallow-tailed kite nesting activity is observed, this information should be documented and reported ([Section 5.2.5](#)).

Because this species has low management opportunity, it is not a good species to monitor to verify the effect of management, and area-specific objectives for this species are not needed. Cooperation with ARCI for future monitoring efforts is encouraged to further define the regional needs of the species and the role of LWRWEA. There is no need to establish an SMA as there is no specific management that could be applied specifically for the benefit of this species. However, nesting platforms have been used to attract swallow-tailed kites to potential nest areas. Constructing platforms on Lake Placid Scrub may be appropriate because the nest on adjacent private land may not be adequately protected. More information is needed to determine if this activity is appropriate ([Section 5.1.1](#)).

The area goal is to promote suitable foraging and nesting habitat for the American swallow-tailed kite that will allow individuals using LWRWEA to continue to function as part of a regional population. The amount of potential habitat and adjacent conservation areas increase the likelihood that American swallow-tailed kites will continue to persist on LWRWEA; however, the continued presence on LWRWEA is dependent on conditions affecting the regional population. The measurable objective is to:

- 1) Assess the need for kite nesting platforms at Lake Placid Scrub by 2013.
- 2) Install appropriate nest platform(s) by the beginning of the 2014 kite breeding season if appropriate.

3.2.8: *Bachman's Sparrow*

Bachman's sparrows occur on Royce Unit and Lake Placid Scrub. Staff detected Bachman's sparrows during vertebrate surveys only at Royce Unit. In May 2011, staff used recorded calls to assess select potential habitat on Royce Unit and confirmed the use of the cutthroat seep (MUs 65 and 85) by this species. The same technique was used at Lake Placid Scrub and sparrows were documented using MU 34. Bachman's sparrows prefer mature pine forests with a healthy herbaceous groundcover and habitat maintained with frequent prescribed fire.

The Bachman's sparrow triggers 2 of 6 prioritization parameters ([priorities table](#)) and is currently experiencing range-wide population declines. Regionally, Bachman's sparrows occur on other conservation areas along the Lake Wales Ridge. ABS reports regular observations of breeding Bachman's sparrows. Highlands Hammock State Park reports this species is rarely observed on the area. A breeding population of Bachman's sparrows is found at APAFR and the species is known to occur at the Arbuckle WMA tract of the LWRSE.

Models indicate 4,113 acres of potential habitat for Bachman's sparrows on LWRWEA, spread across all tracts. Literature suggests a minimum of 520 acres of contiguous habitat is required to maintain a viable population of Bachman's sparrows. Carter Creek has 643 acres of potential habitat and Bachman's sparrows are known to occur at the APAFR and Arbuckle WMA, both within dispersal range of Carter Creek. The Leisure Lakes complex of tracts contains 958 acres of potential Bachman's sparrow habitat; only 108 acres are within tracts completely owned and managed by FWC (Henscratch 27 and Tubbs). Carter Creek has a higher likelihood of appropriate management across potential Bachman's sparrow habitat than the Leisure Lakes complex, but achieving land management objectives on both areas is hindered by factors outside the control of area staff.

Royce Unit, Clements and Highland Park Estates provide 366 acres of modeled potential habitat; however, the cuthroat seep was not included in the potential habitat model. Considering cuthroat seep as potential habitat adds 212 acres, bringing the total to 578 acres, enough to support a viable population. Staff burns the MUs on Royce Unit and Clements containing potential Bachman's sparrow habitat approximately every 2-4 years, which is compatible with the needs of the species. No SMA is recommended at Royce Unit, Clements or Highland Park Estates. Lake Placid Scrub and McJunkin contain 1,634 acres of potential Bachman's sparrow habitat. Given proximity to ABS and the fact that Bachman's sparrows were detected onsite in 2011, these tracts have a high potential to support this species.

Management actions that benefit this species include frequent application of prescribed fire, which is already ongoing in the cuthroat seep at Royce Unit and other areas where the species occurs. Ongoing management is compatible with the needs of Bachman's sparrows so a SMA is not recommended. Additional land management considerations are found in [Section 4.3.5](#).

Bachman's sparrow monitoring is not currently conducted on LWRWEA, aside from incidental observations. A baseline survey within potential habitat at Royce Unit and Lake Placid Scrub is recommended to define where the species occurs on these tracts. This survey should be repeated, preferably on an annual basis, to assess effects of land management on breeding Bachman's sparrows ([Section 5.2.2](#) and [Section 6.15](#)). If resources are available, roving playback calls in the best habitat during peak breeding season at Carter Creek could inform the need for formal surveys. Incidental observations also could be used at Carter Creek as playback calls are not required to detect this species. On other tracts, incidental observations are the appropriate form of monitoring; if Bachman's sparrows are found with more regularity on any tract, the need for monitoring might be reassessed for that tract.

The area goal is to promote suitable foraging and nesting habitat for the Bachman's sparrow that will allow individuals using LWRWEA to continue to function as part of a regional population. The measurable objectives are to:

- 1) Conduct a baseline survey on Royce Unit and Lake Placid Scrub by 2015.
- 2) Repeat this survey on an annual basis to track species response to management.

3.2.9: Brown-Headed Nuthatch

Brown-headed nuthatches are not known to occur on LWRWEA. They were not detected during vertebrate surveys and have not been incidentally observed. They are found at the LWRSF, APAFR and Kissimmee Prairie Preserve State Park (KPPSP). The brown-headed nuthatch is dependent on open stands of mature pine interspersed with snags in which the species excavates nesting cavities. Older pine forests (>35 years for longleaf and slash pine) and stands with basal area between 35–50 ft²/ac (8-11 m²/ha) are preferred. This species triggers 2 of 6 prioritization parameters ([priorities table](#)) and is currently experiencing range-wide declines due to habitat loss and degradation.

Models indicate 1,724 acres of potential habitat on LWRWEA, with the largest contiguous habitat at Carter Creek (643 acres). Literature suggests 1,000 acres of habitat is necessary to support a viable population. The model did not include the cutthroat seep areas (212 acres) on Royce Unit, which brings the total potential habitat at Royce Unit and Clements to 463 acres. Given the condition of the surrounding landscape, this is not enough to support a viable population. Lake Placid Scrub and McJunkin are outside the confirmed or probable breeding range of the species, and were not included in the model. Silver Lake and Sun-n-Lake combine to provide 365 acres of potential habitat, but do not have additional suitable habitat in the surrounding landscape to contribute to a population. The Leisure Lakes complex contains only 338 acres of potential habitat, though more is present on adjacent conservation areas. However, brown-headed nuthatches are not known to occur in this area.

Ongoing efforts to restore and maintain LWRWEA natural community structure and function will improve habitat suitability for the brown-headed nuthatch but occupation is unlikely on most tracts given the small amount of potential habitat and the species' limited dispersal capability. Management actions that maintain or enhance habitat for this species include prescribed fire, silvicultural thinning and management favoring mature timber, and mechanical actions that aid in restoring natural community structure. A shorter fire return interval and the protection of snags during land management activities will further improve habitat suitability ([Section 4.3.6](#)). With appropriate management, it is possible Carter Creek could, help support the regional population that uses the nearby APAFR; however, the area could not support an independent population. Achieving land management objectives at Carter Creek is challenging due to the mosaic of public and private property. This species is known to have limited dispersal capabilities and translocation has been explored on other areas as an option to establish a population. Given that there is not enough contiguous habitat to support a population, translocation of brown-headed nuthatches is not something to consider on the LWRWEA during this Strategy. However, future LWRWEA Strategies may need to consider this action if the species does not colonize the area.

The area goal is to provide suitable foraging and nesting habitat for brown-headed nuthatches on LWRWEA to provide the opportunity for future occupation by this species. Monitoring for this species should be incidental ([Section 5.2.5](#)). However, should brown-headed nuthatches be detected on LWRWEA, the assessment for this species may change for future Strategies.

3.2.10: Cooper's Hawk

Cooper's hawks are rarely observed on LWRWEA, but the species was detected at 6 of the 10 tracts during vertebrate surveys. Cooper's hawks are commonly associated with woodlands and nest in a variety of habitats, including swamps, floodplain and bottomland forests, sand pine scrub and baygalls. Nests usually are placed near the crown of a tree close to an edge in dense stands of oaks. Cooper's hawks primarily feed on other birds, so nests are located in proximity to suitable hunting areas.

The Cooper's hawk triggers 1 of 6 prioritization parameters ([priorities table](#)). From a regional perspective, the Lake Wales Ridge is comprised of a mosaic of conservation areas, private lands and residential development that likely supports a regional population of Cooper's hawks.

Models indicate a total of 5,818 acres of potential habitat for Cooper's hawks on LWRWEA, distributed across 9 tracts. Cooper's hawks are not considered management dependent and the opportunity to affect this species on LWRWEA is low. However, ongoing efforts to restore and maintain natural community structure and function on tracts where the species is known or modeled to occur will benefit the Cooper's hawk. Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical actions that aid in restoring natural community structure.

Because the opportunity to manage the Cooper's hawk is low, local monitoring is not recommended. Species-specific objectives or a SMA would be inappropriate given that there is no specific monitoring or management to apply specifically for the Cooper's hawk. During the nesting season (April-July), the Cooper's hawk is secretive and sensitive to disturbance near the nest site. No attempt will be made to actively search for nests, but incidental observations of nesting or breeding behavior will be noted ([Section 5.2.5](#)) and nesting areas will be protected from disturbance ([Section 4.3.7](#)).

The area goal is to provide suitable foraging and nesting habitat in appropriate areas that will allow individuals using the LWRWEA to continue to function as part of the regional population. However, the continued presence of this species on the LWRWEA is dependent on conditions that influence the regional population.

3.2.11: Florida Mottled Duck

Mottled ducks are most commonly observed on Royce Unit and Lake Placid Scrub, though they have been observed at Silver Lake and Sunray. Mottled ducks frequently use and have been documented to reproduce on the 150-acre recently restored wetland (Peace Pond) on Royce Unit. Adjacent Lake Istokpoga, a 28,000-acre shallow freshwater lake, is part of the upper Everglades Focus Area, one of 5 areas designated as important waterfowl habitat in Florida. Biologists have counted as many as 23,000 ducks of different species in a single day during annual winter surveys. The Lake Istokpoga Working Group (LIWG), an intra-agency FWC group that provides feedback and oversight for lake management actions, addresses the needs of waterfowl on Lake Istokpoga. FWC waterfowl management staff determined in 2009 that artificially stabilized and regulated water levels, and aquatic plant management strategies not compatible with the needs of mottled ducks, have resulted in alterations to vegetation structure and composition. These alterations are limiting mottled

duck use of littoral zones in the lake. These issues are addressed by the LIWG and are outside the control of LWRWEA staff.

Mottled ducks nest in dry marshes, pine flatwoods, citrus groves and urban areas that occur near shallow wetlands. Habitats that are avoided include wet prairies, shrub and forested wetlands, open water and flooded areas. Females tend to locate their nests in dense vegetation (tall grasses, rushes, or palmetto thickets) on the ground near water. Females typically lay 8-10 eggs, incubate them for approximately 26 days, and move their ducklings to water within 24-48 hours of hatching. This species prefers water less than 10 inches deep and wetlands with emergent vegetation. Managers can enhance potential foraging habitat through management activities that provide a mosaic of open water and cover within shallow emergent wetlands. Patchy burns can promote nesting habitat by leaving patches of dense vegetation.

The mottled duck is not listed by either the FWC or the USFWS. This species triggers 2 of the 6 statewide prioritization parameters ([priorities table](#)), making it a medium priority statewide. Models indicate 602 acres of potential habitat for mottled ducks on LWRWEA. Royce Unit/Clements and Highland Park Estates contain 323 acres and 32 acres of potential mottled duck habitat, respectively. Carter Creek has 162 acres of potential habitat and Lake Placid Scrub has 84 acres. The majority of modeled potential habitat for mottled ducks on LWRWEA is basin marsh. Basin marsh is not an actively managed natural community but where possible, managers allow prescribed fire to burn into and across wetlands, reducing hardwood encroachment. This will benefit mottled ducks using these marshes for foraging. The Peace Pond is managed jointly as an herbaceous wetland by LWRWEA staff and the Aquatic Habitat Restoration/Enhancement Subsection.

The level of opportunity to affect the local mottled duck population at the MU scale on LWRWEA is low, and ongoing efforts to restore and maintain natural community structure and function should meet the needs of this species; therefore, a SMA is not recommended. Prescribed fire helps retain the vegetative structure that nesting females prefer; however, it is best to treat only a portion of the potential nesting habitat in any given year. We have reason to believe that nesting occurs in MUs adjacent to the Peace Pond and Lake Istokpoga. To ensure that suitable nesting habitat will be available in every year, only a portion of the nesting habitat will be treated in any given year. If nests are found, land management should be planned accordingly to protect known nests until the young are fledged. This could include prioritizing these MUs for summer burns to avoid burning during the peak nest season.

Observations of newly hatched chicks in wetlands, or nests in the uplands should be documented ([Section 5.2.5](#)) and shared with FWRI ([Section 6.1.4](#)). Because FWC monitors this species at the regional level, surveys specific to LWRWEA are not recommended at this time.

The area goal is to provide suitable foraging and nesting habitat for mottled ducks that will allow individuals using LWRWEA to continue to function as part of a regional population. While the continued presence of this species on the LWRWEA is dependent on conditions that influence the regional population, the location of the area near major habitat concentrations for the species enhances the chances of long-term persistence.

3.2.12: Florida Sandhill Crane

Sandhill cranes are often observed on Royce Unit and Lake Placid Scrub. During the breeding season, adults are observed with flightless young, and nesting has been documented on both sites, including within the marshes around Lake Istokpoga. Sandhill cranes are commonly observed across the Lake Wales Ridge. The Florida sandhill crane is listed as threatened by the FWC and triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a moderate to high statewide priority. Habitat used includes a mosaic of emergent palustrine wetlands and open uplands such as pasture, prairie, and open pinelands. Sandhill cranes use a combination of shallow wetlands and open upland habitats with a majority of the vegetative cover ≤ 20 inches in height. Standing water is an important component of nesting habitat for Florida sandhill cranes. Nests consist of herbaceous plant material mounded in shallow water or marshy areas. Home range size varies seasonally and regionally; approximately 300-600 acres per adult pair.

Models indicate 1,923 acres of potential habitat for sandhill cranes on LWRWEA. This acreage is spread over 12 tracts; Royce Unit, Lake Placid Scrub and Carter Creek contain the most potential crane habitat (742, 624 and 441 acres, respectively). The model did not include the cuthroat areas on Royce Unit or the potential habitat along the Lake Istokpoga shoreline. Considering home range sizes and the potential for home range overlap, Royce Unit could conceivably support at least 2-3 breeding pairs and Lake Placid Scrub and Carter Creek could support at least 1 breeding pair.

Royce Unit contains the most contiguous potential habitat for sandhill cranes, including marsh shoreline along Lake Istokpoga. Approximately 600 acres on Royce Unit is pasture, with approximately 70 acres currently undergoing GCR to restore to mesic flatwoods. A number of focal species, including sandhill cranes and Sherman's fox squirrel, use the pastures on Royce Unit. Continued restoration of pasture to historic natural communities may decrease suitability for focal species dependent on open habitat conditions. GCR that emphasizes open habitat maintained by frequent, growing season fire would be compatible, but is not a priority for sandhill cranes or other focal species on LWRWEA.

Potential habitat at Carter Creek is primarily basin marsh, with little upland foraging habitat available on the WEA. Neighboring private ranches have potential crane habitat. Habitat at Lake Placid Scrub is primarily ruderal, and cranes using Lake Placid use neighboring ranchlands.

Management actions that will benefit sandhill cranes include prescribed fire and mechanical treatments to maintain upland habitat and pastures in the open condition cranes prefer. The restoration of the Peace Pond should be beneficial to this species. Ongoing efforts to maintain LWRWEA current natural community structure and function will improve the suitability of foraging habitat; neither a SMA nor measurable objectives are recommended. Some parameters of nesting habitat, such as hydroperiod, are outside the control of land managers. The observation of nesting birds and the presence of flightless young should be documented and reported ([Section 5.2.5](#)) and known nests should be protected during land management activities ([Section 4.3.9](#)).

The area goal is to provide suitable foraging and breeding habitat for Florida sandhill cranes that will allow individuals using LWRWEA to continue to function as part of a regional population. However, factors affecting the regional population will determine the long-term persistence of Florida sandhill cranes on LWRWEA.

3.2.13: Florida Scrub-Jay

The Florida scrub-jay is a high priority species, both statewide and on the Lake Wales Ridge. The scrub-jay is listed as threatened at the federal level, and triggers all 6 prioritization parameters. The scrub-jay is a high priority and a high opportunity species on LWRWEA, though each individual tract has varying levels of opportunity to contribute to the conservation of this species.

Found in both coastal and ancient scrub-type habitats in peninsular Florida, scrub-jays rely heavily on fire to maintain optimal foraging and breeding conditions in scrub. Optimal habitat for Florida scrub-jays is oak-dominated scrub and scrubby flatwoods with the shrub layer averaging between 4 and 5.5 feet tall. Habitat becomes less suitable when the average shrub height exceeds 6 feet or when all vegetation in a territory is less than 4 feet tall. Optimal habitat has less than 1 pine per acre. Increased pine densities or shorter distances to forest edge will decrease habitat suitability for scrub-jays, possibly by providing cover and perches for predators. Small patches of taller scrub (6-9 feet) cumulatively comprising no more than 1 acre per territory provide habitat heterogeneity. Open ground in the form of open sand or sparse herbaceous vegetation should cover 10–50 % of the territory. In optimal habitat, an average of 25 acres is needed to support 1 family group. The literature indicates isolated populations of less than 10 family groups are highly vulnerable to local extinction; areas that support 10-20 families are marginally secure; areas that support 20-40 families may be adequately protected, and areas supporting >40 families have lower vulnerability to extinction. In all cases, interaction with other populations enhances the chance of persistence.

Potential habitat models indicate 8,093 acres of potential scrub-jay habitat across all tracts of LWRWEA, with 5,499 acres of potential habitat (68%) contained within [megaparcel](#)s. No LWRWEA tracts independently have enough potential habitat to support a stable, viable scrub-jay population; however, all tracts have potential for interaction with scrub-jay family groups on either megaparcel or nearby conservation areas. All of the scrub-jay groups along the Lake Wales Ridge are considered a metapopulation and the future of the scrub-jay on LWRWEA is dependent on conditions affecting the regional metapopulation.

Jay Watch, a citizen-science based monitoring program, monitored scrub-jays on LWRWEA from 2002-2010. In 2011, ABS, TNC and FWC managed the Jay Watch program as a collaborative effort. ABS also monitors scrub-jays on select tracts independently of Jay Watch. The Jay Watch program is in transition and will be managed by Audubon of Florida starting in 2012. Jay Watch volunteers provide all of the scrub-jay monitoring on many conservation areas, including several LWRWEA tracts; however, FWC staff does assist in these monitoring efforts. For more information on monitoring, see [Section 5.2.3](#).

Staff meets annually with ABS to discuss the implications of the previous year's monitoring and to operationally plan prescribed fire on these tracts. This adaptive approach ensures that ongoing land management activities will be conducted in a way that is compatible with the needs of scrub-jays.

Translocation of scrub-jays in Florida has been explored as a species management action. In order to establish scrub-jays on suitable areas on the Lake Wales Ridge that are currently unoccupied or have small populations, translocation may be required. Continued

coordination with ABS ([Section 6.10](#)), FWC's Scrub-jay Coordinator ([Section 6.1.1](#)), and the USFWS ([Section 6.9](#)) is recommended if or when translocation is considered on the Lake Wales Ridge. For more information on scrub-jay translocation, see [Section 5.1.2](#).

In 2011, ABS released a report assessing scrub-jays on managed areas comparing current populations to what was surveyed in 1992-93 ([Statewide Assessment of Florida Scrub-jays on Managed Areas: A comparison of current populations to the results of the 1992-93 survey](#)). This report provides an estimate of carrying capacity for conservation areas with scrub-jay habitat, including LWRWEA. The authors calculated a coarse, conservative estimate of carrying capacity by summing the total potential habitat on a property and assuming that 70% of the potential habitat is occupied at any given time, with the rest of the habitat either recently burned or overgrown. These estimates did not take into consideration specific habitat conditions on each conservation area, such as patchy distribution of scrub across the landscape or factors affecting the likelihood of managing the habitat appropriately for scrub-jays. Therefore, the authors noted that local managers should consider landscape context of habitat patches when refining carrying capacity estimates and setting population goals. Land management considerations, habitat availability and suitability, and potential to support viable breeding populations vary across LWRWEA tracts. Because of this variability and the high priority for managing this species on LWRWEA, we assessed the opportunity to manage for scrub-jays tract by tract. The Lake Wales Ridge is long and linear in configuration, and scrub-jays are known to move between conservation areas on the Ridge. Although we assessed each LWRWEA tract or groups of adjacent tracts independently, scrub-jays may move between tracts that were not assessed together. Where appropriate, we developed tract-specific goals.

Lake Blue and Mountain Lake Cutoff - Lake Blue is in the city of Auburndale and is surrounded by residential and industrial areas. A very small and isolated tract, Lake Blue is modeled to have 63 acres of potential scrub-jay habitat, but scrub-jays are not found there. The surrounding land uses and lack of additional scrub habitat in the vicinity indicate no potential for this species at Lake Blue.

Mountain Lake Cutoff is larger than Lake Blue, but is relatively isolated from other significant areas of scrub. Mountain Lake Cutoff is in the city of Lake Wales, with an elementary school on the southeast corner and Highway 27 along the western boundary. FNAI natural communities' data are not currently available for Mountain Lake Cutoff, but staff estimate 50 acres of scrub habitat at this tract. The greatest potential of this tract is likely as a stepping-stone for scrub-jays moving through the area. While the area could hypothetically support a family group, it is unlikely the area could support any resident scrub-jay groups long-term. Land management on this tract is very difficult to achieve, given the surrounding land uses and proximity to a major highway. This tract is a high priority for prescribed burning, but very specific weather conditions are required. Though Mountain Lake Cutoff has a low opportunity to support scrub-jays, the potential to use the area to educate the public on the management needs and ecological importance of scrub is high.

Given the low opportunity to affect scrub-jays on these tracts, we do not recommend a scrub-jay goal, measurable objective, or SMA.

Sunray - Sunray is located southwest of Frostproof, with most of property being east of Highway 27, and approximately 20 acres located on the west side of the road. FNAI

natural communities' data are not currently available for Sunray, but staff estimate 145 acres of scrub habitat at this site, with an additional 20 acres undergoing the process of restoration from citrus groves. Three scrub-jay groups were observed on this tract in the 1992-93 statewide survey, but scrub-jays have not been found there for several years. The management actions taken by staff have created conditions that make the area suitable to scrub-jays increasing the potential for future occupancy. Immediately adjacent to Sunray, Hickory Lake Scrub County Park has approximately 57 acres of scrub habitat and Sun Ray Scrub (TNC) has an additional 9 acres. Saddle Blanket Scrub Preserve (TNC) is 2 miles to the southwest and has approximately 671 acres of scrub, with 1 scrub-jay group found in 2011. The Arbuckle and Walk-in-the-Water WMA tracts of the LWRSF are approximately 3 miles and 8 miles away, respectively, and these areas have resident scrub-jay populations. Although there is a large amount of scrub habitat within the vicinity of Sunray, it is fragmented. This increases the importance of maintaining Sunray in a condition suitable for use by scrub-jays. Sunray's location between Saddle Blanket Scrub Preserve and the LWRSF make it an important stepping-stone in maintaining the potential for scrub-jay movement between these areas.

The fire history at Sunray prior to State acquisition is unknown. Current conditions within scrub habitat are suitable for use by scrub-jays across 30-40% of the area. The intent is to manage habitat at this tract with prescribed fire; however, highway 27 is a major north-south transportation corridor and conducting prescribed burns is challenging, given public safety concerns for smoke on highways. Staff has taken steps to address the concerns about smoke; these include operational planning for prescribed fire, mechanical treatments to reduce fuel loads, and developing a working relationship with the local FFS office. Additionally, staff made use of a fire contractor to increase the acreage burned at this tract in 2010-11. Ongoing efforts to restore and maintain natural community structure and function on this tract are compatible with the needs of scrub-jays; no SMA is required.

Opportunistic observation ([Section 5.2.5](#)) is the level of monitoring recommended for this tract. If scrub-jays are found at Sunray or properties immediately adjacent, the need for monitoring should be re-visited. The goal for Sunray is to restore and maintain habitat conditions that are conducive to use by scrub-jays in order to help support the regional population.

Silver Lake and Sun-n-Lakes - Silver Lake and Sun-n-Lakes are contiguous tracts located in north Sebring. Silver Lake is owned entirely by the State, but Sun-n-Lakes is a megaparcels. Immediately south and west of these tracts are areas with patchy residential development and many undeveloped lots with scrub habitat. The potential habitat on these tracts is within dispersal distance of scrub-jay potential habitat on Saddle Blanket Scrub Preserve (north), Carter Creek (east) and Highlands Hammock State Park (south). Maintaining scrub-jays on Silver Lake and Sun-n-Lakes will help sustain the regional metapopulation.

The 1992-93 statewide scrub-jay survey of both tracts found 7 scrub-jay groups. Jay Watch has monitored scrub-jays at Silver Lake since 2002, and by ABS has monitored the scrub-jays on these tracts periodically since 2004. In 2009, observers found 14 family groups; 7 family groups using each tract. In 2011, ABS located 2 groups on each tract, and 3 groups using habitat just off-site.

Potential habitat models indicate 383 acres of potential scrub-jay habitat at Silver Lake and 155 acres at Sun-n-Lakes. The 2011 report by ABS indicates a potential carrying capacity of 7 groups on Silver Lake and 9 groups on Sun-n-Lakes. Silver Lake could support more than 7 groups, given the contiguity and condition of scrub-jay habitat, as long as the site continues to be managed appropriately. The ABS estimate for Sun-n-Lakes may be optimistic because of the decreased potential for management. Considering site-specific conditions and assuming some level of continued land management, Sun-n-Lake could likely support 6-8 scrub-jay groups; however, the ability to support scrub-jays at Sun-n-Lakes will decrease with lack of management.

Prescribed fire is the preferred land management tool used on Silver Lake. Silver Lake is less than a mile from Highway 27, there are neighborhoods immediately adjacent to the east, and a small airport to the north; these factors create smoke management challenges. Ongoing efforts to restore and maintain natural community structure and function on Silver Lake are compatible with the needs of scrub-jays; no SMA is required.

Sun-n-Lakes is a [megaparcels](#) with a mosaic of private and State-owned parcels, making land management difficult to achieve. FFS conducted wildfire mitigation burns on approximately 116 acres in 2010, increasing the suitability of this area for fire-dependent species. Additional acreage was treated to the west of Silver Lake, though not within the megaparcels boundary. A SMA for Sun-n-Lakes would not be appropriate as staff is limited in its ability to apply land management to this tract. However, habitat management activities should focus on larger blocks of scrub-jay habitat and lots adjacent to Silver Lake to ensure maximum benefit. Overall, the likelihood of continuing land management to benefit scrub-jays on Silver Lake is high, but it is unknown for Sun-n-Lakes.

The goal for Silver Lake is to maintain habitat in a condition that could support 7 or more scrub-jay groups. The goal for Sun-n-Lakes is to maintain habitat in a condition that could support at least 4 scrub-jay groups, bringing the total for these tracts to >10 groups, thereby increasing the probability of persistence. However, area staff is limited in its ability to affect habitat conditions at Sun-n-Lakes and achieving this goal in the megaparcels may not be possible.

The long-term persistence of scrub-jays on these tracts is dependent on factors affecting the regional population. Factors outside the control of area staff such as development or habitat degradation surrounding these tracts could cause a decline in the scrub-jay population. Continued acquisition of private parcels within Sun-N-Lakes and increased land management in this megaparcels would increase the likelihood of supporting scrub-jays long-term. FWC will work with ABS and Jay Watch to encourage their continued monitoring effort on these tracts ([Section 5.2.3](#)).

Carter Creek - Carter Creek is a [megaparcels](#) located northeast of Sebring. This tract contains a large amount of contiguous scrub habitat and is ranked among the top 20 priority areas for scrub-jays statewide. Carter Creek is within a larger landscape of habitat that includes the Silver Lake and Sun-n-Lakes tracts (west), Highlands Hammock State Park (southwest), APAFR (northeast), LWRSF (north), and the LWRNWR (south).

ABS monitors the scrub-jay population at this megaparcels. In 1992-93, 35 scrub-jay groups were present on this tract. That number decreased to only 3 groups in 2009. Habitat models indicate 1,373 acres of potential scrub-jay habitat on Carter Creek. The ABS report indicates a potential carrying capacity for this tract of 38 groups; however, the method used

to generate this estimate did not account for the landscape context of some potential habitat. Scrub and scrubby flatwoods in this tract are fragmented by patches of wet flatwoods, depression marsh, seepage slope, and floodplain forest along the creek. Scrub-jays are not likely to use small isolated patches or fingers of scrub or scrubby flatwoods surrounded by forest, though they will forage in depression marshes. Additionally, the mosaic of ownership of individual lots in Carter Creek affects habitat management; therefore, it may be more realistic to estimate that Carter Creek could support up to 30 scrub-jay groups.

Staff has initiated actions to address the private ownership issues. Through a collaborative effort, Carter Creek has been fenced and some private landowners have granted staff permission to apply land management. In 2007, LWRWEA staff delineated the first tier of MUs targeting approximately 1,100 acres of fire-suppressed habitat immediately adjacent to known scrub-jay territories. This included 600 acres of scrub and scrubby flatwoods. Since 2007, staff has burned 600 acres (in-house and contracted) to date, including 215 acres of scrub and scrubby flatwoods. These efforts are on-going and a high priority; however, it is not known if these actions are enough to reverse the population decline. Future translocations may be necessary to achieve scrub-jay carrying capacity on this tract. In the meantime, emphasis should continue to be placed on habitat enhancement and monitoring the scrub-jay population's response to management. If translocation is identified as a necessary management action, Carter Creek should be a priority ([Section 5.1.2](#)).

Staff has made strides in applying land management to benefit scrub-jays at Carter Creek. This area is a high priority during burn planning, and should continue to be so. Adding a second tier of MUs including private property will increase the opportunity for population expansion on this tract. Given the constraints and complexity of dealing with private individuals, applying fire, and managing this megaparcels, it is not appropriate to create measurable objectives to track completion of these actions. Instead, these actions are identified as priorities for staff to pursue, along with ongoing land management. To increase the suitability of habitat within MUs, prescribed fire should be applied to remaining acreage within 3-5 years. If additional MUs are designated, it will be important to consider scrub-jay habitat requirements during prescribed fire activities.

The area goal is to reverse the scrub-jay population decline at Carter Creek and maintain habitat in suitable condition to support at least 30 scrub-jay groups. Achieving this goal is largely dependent on obtaining landowner permission to manage private lands within the megaparcels boundary and whether scrub-jays re-populate the site as habitat conditions improve. Translocation may be necessary to achieve a population of 30 scrub-jay groups at Carter Creek. FWC will work with ABS to encourage their continued monitoring effort at Carter Creek ([Section 5.2.3](#)).

Royce Unit/Clements/Highland Park Estates - Royce Unit and Clements are entirely State-owned; Highland Park Estates is a [megaparcels](#) immediately south of Royce Unit. This group of tracts is located east of the town of Lake Placid. Royce Unit/Clements/Highland Park Estates are within dispersal distance of scrub-jay potential habitat on Holmes Avenue (south), LJIWSSP (southwest), Jack Creek and the Leisure Lakes Complex (west) and LWRNWR (north). Though scrub-jay data are often reported per tract, there is interaction between scrub-jays using these tracts. Jay Watch has monitored Royce Unit since 2002, and Clements since 2007. In 2010, 9 scrub-jay groups were found using these tracts and 11

groups were found in 2011. ABS monitored Highland Park Estates in 2010 and found 12 groups.

Habitat models indicate 567 acres of scrub-jay potential habitat at Royce Unit and Clements. The ABS report estimates a potential carrying capacity for these tracts of 19 groups (13 at Royce Unit and 6 at Clements). These sites may be at or close to carrying capacity for scrub-jays, but continued restoration and habitat enhancement may improve conditions. Prescribed fire is the primary management tool, with consideration for providing a mosaic of burned and unburned habitat for scrub-jays. Ongoing management efforts will continue to meet the needs of scrub-jays on these tracts; no additional measures are needed.

Habitat models indicate 973 acres of potential scrub-jay habitat in Highland Park Estates. The ABS report comparing current scrub-jay groups to the 1992-93 surveys indicates a carrying capacity for this tract of 33 groups. Despite the considerable amount of scrub-jay potential habitat, there is little possibility of appropriately managing this tract for scrub-jays. Without management, the potential for scrub-jays to persist is low. Achieving carrying capacity is highly unlikely unless a solution to the megaparcels problem is identified. Focusing management efforts on potential habitat patches close to Royce Unit may be more effective than attempting to manage isolated patches of habitat surrounded by development.

The goal for Royce Unit and Clements is to maintain habitat conditions that will support >10 scrub-jay family groups. The goal for Highland Park Estates is to support scrub-jay groups to enhance stability of the population shared between Royce Unit, Clements and the megaparcels. Challenges to the application of land management in megaparcels reduce the potential for attaining suitable habitat conditions for scrub-jays. Continued acquisition of tracts within Highland Park Estates and increased land management in habitat patches adjacent to Royce Unit will increase the likelihood of scrub-jay persistence on these tracts. FWC will work with ABS and Jay Watch to encourage their continued monitoring efforts ([Section 5.2.3](#)).

Holmes Avenue - Holmes Avenue is a [megaparcels](#) on the outskirts of Lake Placid. Holmes Avenue is within dispersal distance of scrub-jay potential habitat on Lake Placid Scrub (southwest), Royce/Clements/Highlands Park Estates (north) and LJIWSSP (west). Monitored by ABS since 2000, there were 9 groups of scrub-jays in 2000, a peak of 16 groups in 2004, and 12 groups in 2010. Holmes Avenue is an important habitat connection on the east side of Highway 27 and having scrub-jays on site helps connect scrub-jay populations in southern Highlands County.

Models indicate 725 acres of potential scrub-jay habitat at Holmes Avenue, but the current habitat conditions are highly unsuitable for scrub-jays across much of the tract. The ABS report indicates a potential carrying capacity for this tract of 27 groups; however, this report used sandhill when calculating the carrying capacity estimate and the sandhill at Holmes Avenue is not in a condition that could be used by scrub-jays. FWC staff has determined that 20 groups may be more reasonable considering the distribution of scrub on site.

Scrub-jays are currently persisting around the perimeter of this tract, with some use of private lots with scrub that occur across CR 621. As a megaparcels, land ownership is a patchwork of State and private lots. Staff attempted to secure landowner permission to apply land management on selected private lots but has not had the same level of success experienced at Carter Creek. In 2006, 34 acres were burned on the northwest corner of the

tract. Staff prepared another burn in the interior further south, but factors have prevented this burn from being conducted. Staff has worked with FFS to conduct wildfire mitigation burning on this tract, but to date, no mitigation burns have been accomplished. While mechanical treatment of vegetation without subsequent application of prescribed fire is not preferred, it may be the only option for treating some State-owned lots. Because jays do not frequently disperse into small habitat patches surrounded by dense trees, mechanical treatments should focus on expanding the size or enhancing the condition of occupied scrub patches, rather than creating open islands within the dense sand pines across the northern 2/3rds of this tract.

If staff can obtain landowner permission to manage private lots, this site would have a more promising future. Staff should prioritize coordination with FWC's Conservation Planning Services (CPS; formerly Habitat Conservation Scientific Services) and FWC's legal department to determine an approach for contacting private landowners to secure permission to apply management.

The goal for Holmes Avenue is to continue to have scrub-jays nest on the property and support the regional population. Because the opportunity to apply land management to benefit scrub-jays on Holmes Avenue is extremely limited at this time, measurable objectives would be difficult to achieve and are not identified. However, if a method to obtain landowner permission to apply land management is developed, this assessment should be revisited. FWC will work with ABS and Jay Watch to encourage their continued monitoring efforts at Holmes Avenue ([Section 5.2.3](#)).

Leisure Lakes Complex (Henscratch, Henscratch 27, Messana, Tubbs, Orange Blossom, Leisure Lakes) - This complex of tracts is located northwest of Lake Placid. Florida owns Henscratch 27, Messana and Tubbs entirely; the remaining tracts are [megaparcel](#)s. Together, Leisure Lakes and Henscratch are the largest megaparcel on the LWRWEA, and the most heavily developed. The Leisure Lakes Complex is adjacent to scrub-jay potential habitat on Jack Creek and LJIWSSP, and is within dispersal distance of potential habitat on Lake Placid Scrub (south), Holmes Avenue (southeast), Royce/Clements/Highlands Park Estates (east), LWRNWR (northeast) and Highlands Hammock State Park (northwest). This block of conservation lands is a vital link between other conservation lands that support scrub-jays, and retaining scrub-jays in this block of conservation lands is critical to the long-term persistence of the regional metapopulation.

Scrub-jays using the Leisure Lakes (a.k.a. Highlands Ridge) complex have been monitored by ABS since 2000. The number of groups has declined from 57 to 18 since 2000, largely because of the increase in residential development and fire suppression. The ABS report comparing current scrub-jay groups to the 1992-93 surveys indicates a potential carrying capacity of 77 for this group of tracts. The outlook for this population is bleak, and the ability to affect habitat conditions on parcels owned by the State is extremely limited. Periodic wildfires may create habitat conditions that help slow the decline of the population. However, research has shown scrub-jays in urban areas are at high risk of extirpation, as evidenced by the decline in the population in this area over the past decade.

Habitat models indicate 2,400 acres of potential scrub-jay habitat within this complex of areas. Of the modeled potential habitat, only 128 acres are on tracts that are owned entirely by the State (Henscratch 27 and Tubbs); the rest is contained within megaparcel s. With management, the potential habitat in this complex of areas could support a stable scrub-

jay population, but habitat conditions are decreasing in suitability with little chance for significant restoration.

Other conservation areas in the vicinity contribute to the amount of habitat available for scrub-jays. Jack Creek, LJIWSSP and Henscratch Conservation Easement are large protected areas adjacent to or near the Leisure Lakes complex. ABS estimated the potential carrying capacity for Jack Creek at 13 groups, LJIWSSP at 19 groups, and 9 groups at Henscratch Conservation Easement. One scrub-jay group was found at Jack Creek in 2010 but none were found in 2011; 7 groups were found at LJIWSSP in 2009; and no groups were found at Henscratch Conservation Easement in 2010. As habitat conditions continue to decline in the megaparcels, the importance of these conservation lands to the regional scrub-jay population will increase. Even though staff is extremely limited in their ability to affect land management over much of the Leisure Lakes complex, any activities that will add to the amount of potential habitat available on existing protected areas such as LJIWSSP or Jack Creek should take priority. Focusing efforts to apply prescribed fire to habitat near an existing conservation area as well as continued coordination with FFS to guide wildfire mitigation activities should be a priority. Any habitat maintained in suitable condition on this complex has the potential to help support the regional population that occurs on the surrounding conservation lands.

There is a large amount of scrub habitat in private ownership in and around this complex of tracts. Acquisition emphasis should be placed on parcels that connect existing State lands or are large enough to safely apply land management without affecting private lands. Large landowners should be encouraged to coordinate with CPS and USFWS to develop conservation easements and management plans for scrub species ([Section 6.1.5](#) and [Section 6.9](#)).

The goal for Henscratch 27 and Tubbs is to support the regional population by appropriately managing all scrub to benefit scrub-jays. Excepting Henscratch 27 and Tubbs, staff is extremely limited in what can be accomplished to benefit scrub-jays on this complex. For this reason, the goal for the megaparcels in the Leisure Lakes complex is to continue to have scrub-jays nest on the property and support the regional population. FWC will work with ABS to encourage their continued monitoring effort in this area ([Section 5.2.3](#)). Though this area contains significant amounts of scrub-jay habitat protected as conservation areas, the amount of current and potential future residential development within and around the area negatively affects the scrub-jay population. These areas may be more appropriately managed as a habitat linkage for scrub-jays moving between the northern and southern Lake Wales Ridge rather than as a self-sustaining scrub-jay population.

Lake Placid Scrub/McJunkin/Gould Road - These are the southernmost LWRWEA tracts, with Lake Placid Scrub and McJunkin adjacent to one another Highway 70 in between. McJunkin shares its eastern border with ABS. Gould Road is along Highway 27, a few miles east of McJunkin. These tracts are within dispersal distance of potential scrub-jay habitat on Holmes Avenue (northeast) and LJIWSSP (north).

ABS monitors the scrub-jays on all 3 tracts. When surveys began in 2000, there were 21 scrub-jay groups at Lake Placid Scrub and 8 at Gould Road. Initial surveys at McJunkin in 2005 found 21 groups. In 2010, Lake Placid Scrub had 34 groups, McJunkin had 22 and Gould Road had 5.

Models indicate 739 acres of potential scrub-jay habitat at Lake Placid Scrub, 543 acres at McJunkin, and 172 acres at Gould Road. The ABS report indicates a potential carrying capacity of 25 scrub-jay groups for Lake Placid Scrub, 15 for McJunkin, and 5 for Gould Road. Currently, these tracts meet or exceed the ABS estimated carrying capacity. Further, ABS documented 116 scrub-jay groups on their property in 2010 even though the estimated carrying capacity is only 88 groups. The estimated carrying capacities for these tracts are lower than the number of current scrub-jay groups. This may be a factor of the method used to delineate habitat for the carrying capacity estimates. The ABS study did not include secondary habitat types (e.g., mesic flatwoods, depression marshes) when estimating carrying capacity; this can result in underestimates of carrying capacity on properties where secondary habitat forms a mosaic with primary habitat types. In the case of these tracts, the actual amount of potential habitat exceeds that used for the estimate.

Each area is managed and monitored separately, though there is interaction between scrub-jays at these LWRWEA tracts and ABS. The scrub-jay population on these tracts is considered to be in ideal condition, indicating that ongoing land management activities are meeting the needs of scrub-jays. The relatively large size of this population enhances the chance of long-term population persistence. There are no specific management actions recommended for scrub-jays on these tracts, therefore a SMA and measurable objectives are not recommended. The goal for each of these tracts is to maintain habitat in suitable conditions to maintain Florida scrub-jays at or above the ABS estimated carrying capacity. FWC will work with ABS and Jay Watch to encourage their continued monitoring efforts on these tracts ([Section 5.2.3](#)).

3.2.14: Limpkin

Limpkins are highly mobile and influenced by regional water levels and the availability of prey items, primarily fresh water mollusks. Limpkins typically inhabit freshwater marshes, swamps, springs, and spring runs. On LWRWEA, limpkin are rare, having only been documented on Royce Unit and the adjacent Lake Istokpoga. The LIWG, an intra-agency FWC group, provides feedback and oversight for lake management actions ([Section 6.1.3](#)) and the LWRWEA lead area biologist provides guidance to the LIWG regarding the effects of lake management activities on wading birds, including the limpkin.

Limpkins are a FWC species of special concern and trigger 1 of 6 prioritization parameters ([priorities table](#)). Models indicate 667 acres of potential habitat for this species on LWRWEA, divided over 4 tracts, with the majority of potential habitat on Royce Unit. Since this is not enough habitat to support an independent population of limpkins, limpkins using LWRWEA are part of a larger regional population. While limpkins live in wetland habitats that are typically not actively managed, flatwoods and marsh habitats used by this species can be improved with the use of prescribed fire, which prevents shrub encroachment and enhances foraging opportunities for this species.

The level of opportunity to influence the local population of this species on LWRWEA is low and ongoing efforts to maintain natural community structure and function should meet the needs of this species, therefore we do not recommend a SMA. Because this species has significant dispersal capabilities and is affected by regional water levels, local monitoring is not recommended. The area goal is to continue to provide suitable foraging habitat for limpkins that will allow individuals using LWRWEA to function as part of a

regional population. However, factors affecting the regional population will influence the long-term persistence of limpkins on LWRWEA.

3.2.15: Northern Bobwhite

Northern bobwhite are commonly observed on all LWRWEA tracts. One of 2 game species addressed by the WCPR program, northern bobwhite triggers 2 of 6 prioritization parameters ([priorities table](#)). Northern bobwhite have experienced significant range-wide population declines since the 1960s and are currently a major focus of many initiatives including the Upland Ecosystem Restoration Project.

Northern bobwhite are associated with open canopy forests and grassland communities dominated by warm-season grasses, legumes, and patchy bare ground. Weedy areas are used for raising broods and foraging; shrubs or other thickets are useful as roosting habitat or escape cover. The frequent application of prescribed fire can be used to create the mosaic of vegetation conditions this species requires to meet its life history needs.

Literature suggests that 2,000 – 4,000 acres are necessary to support a viable population. Models indicate 15,057 acres of potential habitat for this species on LWRWEA. Lake Placid Scrub and McJunkin contain 3,080 acres of potential bobwhite habitat. Combined with habitat at adjacent ABS, these tracts have a high opportunity to support a northern bobwhite population. Silver Lake and Sun-n-Lakes provide 1,200 acres of potential habitat. Royce Unit, Clements and Highland Park Estates provide almost 3,440 acres of potential habitat, but slightly less than half of this is within the megaparcels.

Almost 57% (8,548 acres) of potential northern bobwhite habitat on LWRWEA is contained in [megaparcels](#). Achieving land management objectives within megaparcels is challenging due to the mosaic of public and private property. Because of the dependence of northern bobwhite on high quality, early successional habitat, and because the State-owned property of the LWRWEA is not contiguous, LWRWEA has a limited role in reversing the statewide decline of this species. However, many tracts contain more than 100 acres of potential habitat and help support the regional population. Management actions that maintain or enhance habitat for northern bobwhite include prescribed fire and mechanical actions that aid in restoring natural community structure ([Section 4.3.11](#)). Ongoing management on LWRWEA is compatible with the needs of northern bobwhite and should maintain the current population level; therefore, no SMA is recommended.

The area goal is to maintain suitable foraging, brooding and nesting habitat for bobwhite quail on LWRWEA to continue to support the regional population. However, factors affecting the regional population will influence the long-term persistence of northern bobwhite on LWRWEA.

3.2.16: Short-Tailed Hawk

Short-tailed hawks have been observed on 6 LWRWEA tracts (Sunray, Royce Unit, Carter Creek, Holmes Ave, Leisure Lakes and Lake Placid Scrub). The ARCI, a research organization that conducts statewide research on swallow-tailed kite and short-tailed hawk populations, surveyed the Lake Wales Ridge in 2008 and found nests of both species at several locations, though none on LWRWEA. In this survey, ARCI documented high levels

of short-tailed hawk activity along the east shore of Lake Istokpoga (Royce Unit, Clements and Holmes Avenue are on or near the west shore).

The short-tailed hawk is an elusive species that breeds in dense or open woodland stands in wetlands, cypress swamps and bayheads. Vegetation surrounding nest trees is often very dense, making it difficult to locate and assess nests from the ground. This species exhibits high nest-site fidelity, emphasizing the value of locating and preserving nest sites. Foraging habitat includes prairies and open areas adjacent to nesting areas. Transitional zones and ecotones may be important components of foraging habitat for this species. The short-tailed hawk triggers 6 of 6 prioritization parameters, making it a high statewide priority.

Models indicate 840 acres of potential habitat for this species on LWRWEA; of this, 771 acres are at Royce Unit. Though models identified a relatively small amount of potential habitat on LWRWEA, given the linear distribution of tracts along the Lake Wales Ridge and proximity to documented nesting areas, short-tailed hawks likely use more habitat than was mapped. Management actions that maintain or enhance foraging habitat for this species include prescribed fire and mechanical actions that aid in restoring natural community structure. [Section 4.3.12](#) provides additional land management recommendations.

Local monitoring is not recommended because this species naturally occurs in relatively low densities and is not management dependent. There is no need for an SMA or area objective as the opportunity to affect this species on LWRWEA is low. Monitoring for this species will be opportunistic and should include color phase ([Section 5.2.5](#)) and the information should be shared with ARCI ([Section 6.6](#)). FWC should cooperate with ARCI on future monitoring efforts to further define the regional needs of the species and the role of LWRWEA.

The area goal is to continue to provide suitable foraging and nesting habitat for the short-tailed hawk that will allow individuals using LWRWEA to function as part of a regional population. However, the continued presence of short-tailed hawks on LWRWEA is dependent on conditions that influence the statewide population.

3.2.17: Snail Kite

The snail kite is a focal species on LWRWEA because of the area's proximity to Lake Istokpoga, a shallow 28,000-acre lake in eastern Highlands County. The current range of the snail kite is restricted to watersheds of the Everglades, Lake Okeechobee, Kissimmee River, Loxahatchee Slough, and Upper St. Johns River. Lake Istokpoga is a known breeding site for snail kites. Royce Unit has approximately 2.7 miles of shoreline along the western edge of the lake. In March 2011, 3 snail kite nests were found on Lake Istokpoga, one near the Royce Unit shoreline. Only 1 nest was found on the lake in 2010.

The snail kite is highly dependent upon availability of its primary food source, the apple snail (*Pomacea paludosa*), which requires high-quality wetland habitats with emergent vegetation. Water levels have a significant influence on snail kite nest success. Snail kites are highly mobile, and the individuals on Lake Istokpoga function as a part of the statewide snail kite population. The snail kite is a federally endangered species, and triggers 4 of the 6 statewide prioritization parameters ([priorities table](#)) and is a high statewide priority.

Potential habitat models indicate 407 acres of potential habitat on Royce Unit/Clements and Highland Park Estates, and 287 acres on other tracts (Carter Creek,

Henscratch, Lake Placid Scrub and Silver Lake). This is not enough habitat to independently support a viable population. While snail kites will forage in small wetland systems outside of the breeding season, Lake Istokpoga is the only place where nesting occurs near LWRWEA. However, ongoing natural community management including exotic plant control and prescribed fire in marshes and wetlands should promote suitable foraging habitat for this species by preventing shrub encroachment and supporting growth of appropriate native vegetation.

Hydrology plays a major role in snail kite population levels. Water levels on Lake Istokpoga rarely fluctuate by more than a foot or 2 annually. Without a significant drawdown, appropriate vegetation management cannot occur. Additionally, regional conditions outside the control of the area manager have significant influence on populations of snail kites and the snails they eat. Because area staff has a low opportunity to influence the snail kite population on Lake Istokpoga, a SMA or measurable objective is not appropriate. FWC's Snail Kite Coordinator ([Section 6.1.1](#)) currently monitors nesting snail kites at Lake Istokpoga and represents the species on the LIWG ([Section 6.1.3](#)). No other monitoring is necessary at this time, although observations of nesting, nesting behavior, or snail kite pairs will be documented and the information shared with researchers ([Section 5.2.5](#)).

The area goal is to continue to provide suitable foraging habitat for snail kites that will allow individuals using LWRWEA to function as part of the regional population. However, the continued presence of snail kites on LWRWEA is dependent on conditions that influence the statewide population.

3.2.18: Southeastern American Kestrel

The southeastern American kestrel is occasionally observed on Mountain Lake Cutoff, Silver Lake, Royce Unit, and Leisure Lakes; with documented reproduction at Mountain Lake Cutoff and Silver Lake. In 2008, staff installed 19 kestrel boxes at 5 tracts (Royce, Clements, Lake Placid Scrub, Mountain Lake Cutoff and Silver Lake) and initiated breeding season monitoring in 2009. A breeding pair of Kestrels has used 1 box at Silver Lake each breeding season since monitoring began, with a second pair activating a second box in 2011. Kestrels used the box at Mountain Lake Cutoff for the first time in 2011. Staff removed 2 boxes at Royce Unit in 2010 because the density of nest boxes was too high.

Southeastern American kestrels utilize upland habitats including sandhills, longleaf savannas, pastures, sand pine scrub, and prairies. As a secondary cavity nester, southeastern American kestrels use previously excavated cavities in large snags. They will utilize artificial cavities in areas of suitable habitat. Kestrels require adequate perch sites within foraging areas for hunting, and low ground cover (<1 ft) and an open canopy (<20% cover) are ideal for this species. Average breeding territory size is 125 acres, though more area may be necessary if the habitat quality is marginal. Southeastern American kestrels are listed by the FWC as a threatened species and trigger 4 of 6 prioritization parameters ([priorities table](#)).

Models indicate 11,424 acres of potential habitat for kestrels on LWRWEA. From a regional perspective, southeastern American kestrels breed at other areas along the greater Lake Wales Ridge and suitable potential habitat is prevalent. It is unlikely that LWRWEA could support an independent, viable population given the geographic separation of tracts; however, there is a high level of opportunity for contributing to the regional kestrel

population by promoting kestrel breeding habitat and providing artificial cavities. Land management within megaparcels is challenging and unlikely to occur on all areas with potential kestrel habitat; habitat fragmentation and degradation will likely affect kestrels utilizing habitat within megaparcels in the future. Management actions that maintain or enhance habitat for this species include managing for mature, open stands of longleaf pine maintained with prescribed fire and mechanical actions that aid in restoring natural community structure. Additional land management considerations including the protection and creation of snags can be found in [Section 4.3.13](#).

Ongoing efforts to restore and maintain LWRWEA's natural community structure and function outside of the megaparcels will improve the habitat suitability for kestrels; therefore, no SMA is required. Monitoring for southeastern American kestrels will continue according to a protocol developed by FWRI as part of a statewide kestrel nest box monitoring program ([Section 5.2.4](#)). Staff shares the results of this monitoring with FWRI ([Section 6.1.4](#)) and use the results to assess the need for additional boxes ([Section 5.1.3](#)).

The area goal is to promote suitable foraging and nesting habitat for southeastern American kestrels that will allow individuals using LWRWEA to continue to function as part of a regional population. The measurable objectives are to:

- 1) Maintain at least 17 functional nest boxes within suitable habitat on LWRWEA.
- 2) Evaluate all tracts with some emphasis on the Leisure Lakes area for suitability and install boxes where appropriate for the duration of this Strategy.

3.2.19: Southern Bald Eagle

Bald eagles are commonly observed on 3 LWRWEA tracts (Silver Lake, Royce Unit and Lake Placid Scrub) with documented nesting and reproduction on Royce Unit and Lake Placid Scrub (4 and 2 known eagle nests, respectively). While all 3 nests on Royce Unit were inactive 2010, 1 was active in 2011. Staff located the fourth nest on Royce Unit in May 2011. At Lake Placid Scrub, both nests were surveyed in 2010 but only the nest along the shores of Lake Placid was active; the other was last active in 2002.

The bald eagle does not trigger any of the prioritization parameters, but is protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The FWC approved a Bald Eagle Management Plan in 2008 to ensure the continued recovery of this species. This plan designated 16 Core Nesting Areas (CNAs), which are defined as areas containing high densities of bald eagle nesting territories. From a regional perspective, 3 of these CNAs, the Kissimmee Chain of Lakes, central Polk county, and Lake Istokpoga, are located in Polk and Highlands counties.

Models identify 2,917 acres of potential habitat for bald eagles in current natural communities on LWRWEA, divided among 9 tracts. Bald eagles are not considered management-dependent and the opportunity to influence them on LWRWEA is low. However, ongoing efforts to maintain LWRWEA's natural community structure and function will benefit this species. Management actions that maintain or enhance habitat for this species include managing for mature stands of trees, applying prescribed fire, and applying mechanical actions that aid in restoring natural community structure, provided that nest protection guidelines are followed.

Because eagles naturally occur in relatively low densities, the species is more appropriately monitored at a statewide or regional basis. As there are no specific

management activities recommended for bald eagles there is no need to establish measurable objectives or an SMA. Any activities around nest sites will be conducted according to guidance in the management plan (Section 4.3.14). New nesting sites will be documented and reported (Section 5.2.5 and Section 6.1.4).

The area goal is to continue to provide suitable foraging and nesting habitat for the southern bald eagle that will allow individuals using LWRWEA to function as part of a regional population. The continued presence of this species on LWRWEA is dependent on conditions that influence the regional population, but the proximity to CNAs increases the potential for this species to persist on the LWRWEA.

3.2.20: Wading Birds

Five of the 8 focal species of wading birds [great egret (*Ardea alba*), snowy egret (*Egretta thula*), little blue heron (*E. caerulea*), tricolored heron (*E. tricolor*) and white ibis (*Eudocimus albus*)] are commonly observed on LWRWEA. The wood stork (*Mycteria americana*) is occasionally observed, the roseate spoonbill (*Platalea ajaja*) is rare, and the reddish egret (*Egretta rufescens*) has not been documented. Wood storks are observed more frequently at Royce Unit since the restoration of the 150-acre Peace Pond.

Statewide, this group of species is a moderate priority. Several species are FWC-listed species of special concern and the USFWS lists the wood stork as endangered. The Millsap biological scores for the reddish egret, little blue heron, and wood stork are high. The snowy egret, little blue heron, and roseate spoonbill have SGCN declining population trends while the tricolored heron and white ibis have unknown trends. Regionally, these species are observed on many conservation areas and lakes in Highlands and Polk counties.

Based on 2010 nest colony locations, most LWRWEA tracts fall within at least 1 core foraging area for wood storks. Most wading bird occurrences on the LWRWEA are at Royce Unit, because of its proximity to Lake Istokpoga. Wading bird habitat is limited to the perimeter of Lake Istokpoga and marshes around the named islands. In 2006-07, FWC conducted 8 wading bird surveys within this habitat to provide feedback to the LIWG, an intra-agency FWC group that provides feedback and oversight for lake management actions. Additionally, since 2002, Audubon, with assistance from FWC, has periodically monitored wading bird breeding colonies on the lake. The last assessment was in 2008, and Audubon may survey in 2012. Aside from the breeding colonies on Lake Istokpoga, no other colonies are known to occur on LWRWEA.

Models indicate 4,628 acres of potential habitat for wading birds on LWRWEA. Royce Unit, Clements and Highland Park Estates combine to provide almost 2,300 acres of potential wading bird habitat. Proximity to Lake Istokpoga increases the importance of these tracts for wading birds. Additionally, Peace Pond, a 150-acre restored marsh on Royce Unit, is a heavily used wading bird foraging area; this restoration has increased the amount of potential wading bird habitat. Approximately 2,700 acres of potential habitat are within [megaparcels](#) tracts. The ability to affect habitat quality within the megaparcels is extremely limited. A few large marsh systems occurring within the Carter Creek, Henscratch and Leisure Lakes megaparcels, would benefit from prescribed fire; however, applying prescribed fire in these areas is unlikely. Carter Creek has the highest opportunity for overall habitat management, but private lots bisect the large basin marsh containing potential wading bird habitat. Creating firelines through this wetland is not desirable.

Wading birds may travel great distances between foraging and roosting habitat, and the opportunity to affect the regional populations of these species on LWRWEA is low, even in areas where management is not constrained by property ownership issues. Furthermore, management actions on Royce Unit will have little effect on wading bird habitat within Lake Istokpoga, therefore no SMA is proposed. While not dependent on actively-managed natural communities, wading birds benefit from the application of prescribed fire in wetland habitats. Where possible, fire should be allowed to burn across marshes and wetlands to decrease shrub encroachment. If breeding colonies are found on LWRWEA, managers will provide appropriate protection during land management activities ([Section 4.3.15](#)) and document and report those colonies ([Section 5.2.5](#)). Continued involvement in the LIWG is essential to ensure future lake management activities are compatible with the needs of wading birds ([Section 6.1.3](#)).

The area goal is to continue to provide suitable foraging and breeding habitat for wading birds that will allow individuals using LWRWEA to function as part of the regional populations. While the continued presence of these species on LWRWEA is dependent on conditions that influence the regional population, the number of lakes and wetlands systems on and adjacent to the Lake Wales Ridge increases the potential for these species to persist on the LWRWEA.

3.2.21: Florida Black Bear

All LWRWEA tracts except for Mountain Lake Cutoff and Lake Blue fall within FWC's Glades Highlands Bear Management Unit (GHBMU). Bears or bear sign have been observed on all tracts within the GHBMU except for Sunray. The Glades Highlands black bear population is the second smallest in Florida and is highly threatened by loss, degradation and fragmentation of habitat, and vehicular mortality. This bear population has occasional interaction with the Big Cypress population and may be the only linkage between bears in Big Cypress and bears in the rest of Florida.

The Florida black bear is FWC-listed as threatened. However, a 2011 review of the biological status of bears in Florida found they no longer meet the criteria for this listing and the species will be de-listed once the bear management plan is approved. This species triggers 2 of 6 prioritization parameters ([priorities table](#)).

The Florida black bear is a wide-ranging species capable of significant dispersal. Home range sizes vary according to resource availability and the level of habitat fragmentation on the landscape. A mosaic of flatwoods, swamps, scrub oak ridges, bayheads, and hammocks provides adequate den sites, a diversity of seasonally abundant food sources, and cover when traveling between these habitat types.

The Glades Highlands bear population is heavily studied. Most recently, FWC, ABS, and the University of Kentucky collaborated on projects involving home range size and delineation, habitat selection, and bear movement. Telemetry studies have been conducted since 2004 and provide key information about habitat use, home range size, and food preferences for this bear population. Specifically, this research found that the population is divided into 3 population sub-centers, where adult female home ranges are clustered in one particular area and males move between areas. This clustering appears to be in response to roads. Furthermore, this research highlights which habitat types bears select seasonally and what food items are preferred. Because of the resolution of the telemetry data, key areas for

movement between sub-centers and across roads and highways were identified, providing managers and private landowners opportunities to facilitate bear habitat use and movement across the range of the population. Ongoing telemetry and hair-snare research will provide more information about this bear population.

Models indicate 14,408 acres of potential habitat for Florida black bears on LWRWEA with 5,670 acres contained within [megaparcels](#). While this is not enough habitat to independently sustain a population in the long-term, bear telemetry research has found that certain LWRWEA tracts may be critical to the long-term persistence of this population. Females have established a population sub-center on Clements and adjacent Royce Unit, primarily within the bayhead on Clements. Females within the sub-center at the privately owned XL Ranch use habitat on nearby Lake Placid Scrub and McJunkin. Bears regularly use the Holmes Avenue tract, which appears to be a key corridor for movement from north to south. Carter Creek and Silver Lake have seen increased bear usage in the past few years, but are not expected to become population sub-centers. Other tracts likely provide cover for bears moving across the landscape.

On LWRWEA, tracts within or near population sub-centers, such as Royce Unit, Clements and Lake Placid Scrub, also have the longest histories of land management. This may indicate that management on LWRWEA including ongoing efforts to restore and maintain natural community structure and function may be compatible with the needs of the Florida black bear. However, bear use of these tracts may be attributed to tract size or location within the landscape of the Lake Wales Ridge. For example, bears use Holmes Avenue frequently, and this tract has a very limited history of land management.

Land management activities that promote a mosaic of vegetation structure across the landscape will provide forage and cover for bears, but land management activities such as frequent prescribed fire can decrease denning habitat or cause direct mortality to denning bears. Bear denning and foraging habitat occur across all tracts within the GHBMU, and this habitat is interspersed with actively managed natural communities that support other focal species with a variety of habitat requirements. Across all tracts within the GHBMU, managers should consider the forage, cover, and denning habitat needs of bears and plan land management activities to create conditions that continue to support bears using these areas. Staff will continue to address this planning need by meeting annually with ABS to discuss impacts of land management on bears and research projects, and communicate as needed with bear researchers regarding land management. To ensure the Clements tract continues to support a regional sub-population of breeding black bears, a SMA is recommended for the bayhead natural community on this tract ([Section 4.1.1](#)). When planning a prescribed burn or mechanical treatment in flatwoods in or near a bear population sub-center, staff will consider if a longer fire-return interval is appropriate given the current vegetation conditions. This management approach should be revisited if it is found that land management is negatively affecting the bear population on LWRWEA. See [Section 4.3.16](#) for more information on land management.

Research has shown that a diversity of habitats across the landscape, including xeric uplands, bay swamp, oak and cabbage palm hammocks, and pine flatwoods is beneficial for bears. To protect bear habitat through acquisition, a diversity of forested lands should be added to the LWRWEA rather than targeting only xeric upland habitat, which is already predominant on the area. Furthermore, private lands play an important role in the persistence of the Glades Highlands bear population. Three large private ranches were identified as

critical to black bears and fortunately, all are currently owned and managed by conservation-minded individuals who are supportive of bear conservation. However, only one of these ranches is covered by a conservation easement. Key linkages on private lands between population sub-centers could be lost to development that is incompatible with the needs of bears. This would further fragment an already threatened population. Coordinating with private landowners and encouraging them to promote the presence of this species will be vital to conservation of Florida black bears in this population ([Section 6.1.5](#)). Public education and awareness is vital to reduce nuisance bear issues and promote bear conservation.

Bear mortality due to vehicle strikes is common on roadways on the Lake Wales Ridge. Research has shown specific road crossing locations apparently preferred by bears moving between population sub-centers. When local staff are aware of proposed road work in these areas, they should coordinate with ABS and the bear management program to ensure these entities are coordinating with the appropriate county and state agencies to facilitate the installation of wildlife crossings where appropriate to reduce vehicle-caused mortality ([Section 6.10](#)).

Monitoring this bear population is best done at the landscape level and research by FWC's Bear Research program, ABS, and the University of Kentucky will continue. LWRWEA staff will continue to coordinate with Bear Management and Research ([Section 6.1.6](#) and [Section 6.1.4](#)) and ABS ([Section 6.10](#)) to ensure LWRWEA tracts continue to contribute to the persistence of the Glades Highlands bear population. This includes documenting and reporting incidental observations ([Section 5.2.5](#)) of female bears with cubs as well as bears outside the known range.

The area goal is to continue to provide suitable foraging and denning habitat where appropriate on the LWRWEA to ensure bears using the LWRWEA contribute to the persistence of the regional population. However, the long-term persistence of this species is dependent on factors that influence the regional population.

3.2.22: Florida Mouse

The Florida mouse occurs on all LWRWEA tracts except for Lake Blue and Mountain Lake Cutoff; staff captured Florida mice at least once at each tract during vertebrate surveys. The Florida mouse lives in sandhill and scrub habitats, and relies almost exclusively on gopher tortoise burrows for refuge. Gopher tortoises are commonly observed on LWRWEA ([Section 3.2.5](#)). While acorns are an important food source for this species, having a diverse ground cover that provides a diversity of food throughout the year is equally important.

The Florida mouse triggers 4 of 6 prioritization parameters ([priorities table](#)) and is listed by FWC as species of special concern. On the Lake Wales Ridge, the Florida mouse was assessed as a focal species in the "State of the Scrub Report". Literature suggests this species needs 75–200 acres to support a viable population. Models indicate 8,094 acres of potential habitat for the Florida mouse on LWRWEA. The acreage within current natural communities on individual tracts (or groups of tracts) is potentially large enough to support viable populations, with the probable exception of Lake Blue. However, it is important to note that 5,228 acres (65%) are contained within [megaparcels](#) where appropriate

management for this species is challenging due to land management constraints outside the control of area staff.

The use of prescribed fire and management that favors healthy and diverse ground cover with appropriate shrub cover will benefit this species; therefore, no SMA is recommended. Staff use mechanical treatment to create and maintain firebreaks, and to reduce vegetation prior to the application of fire in MUs that are close to property boundaries, houses, and roads. Occasionally, staff applies mechanical treatment to an entire MU when vegetation characteristics limit the safe application of prescribed fire. The Florida mouse benefits from a mosaic of vegetation conditions in a given MU. Managers can achieve this mosaic by applying a variety of land management techniques, such as practicing the 'sloppy chop' method during mechanical treatments to leave patches of oaks untouched and by promoting patchy burns during prescribed fire activities.

Currently, there are no small mammal monitoring efforts on LWRWEA. Staff could use information gathered by monitoring the Florida mouse population to assess the effects of mechanical treatment. Researchers could use population monitoring and habitat management information to learn more about what constitutes optimal habitat quality for the Florida mouse. However, resources to accomplish activities above and beyond what is already ongoing are limited. A monitoring protocol is being developed by the WCPR program. If additional resources become available, initiating surveys according to this protocol is recommended.

The area goal is to maintain viable Florida mouse populations on all tracts of LWRWEA owned entirely by Florida that contain greater than 75 acres of potential habitat.

3.2.23: Sherman's Fox Squirrel

Sherman's fox squirrels are known to occur on 3 LWRWEA tracts (Royce Unit, Lake Placid Scrub and McJunkin). In January 2011 and again in September 2011, a female was observed moving young near the field office at Royce Unit. Fox squirrels occur on other areas across the Lake Wales Ridge and there is suitable habitat for them in the greater landscape. The large number of private cattle ranches on and around the Lake Wales Ridge likely contributes to the regional fox squirrel population, though a formal population assessment has not been done recently.

This FWC-listed species of special concern triggers 4 of 6 prioritization parameters ([priorities table](#)). Suitable habitat for Sherman's fox squirrel includes longleaf pine sandhills or flatwoods with a mixture of mature pines and oaks and a sparse to moderate shrub layer. Sherman's fox squirrels appear to do best in mature longleaf pine stands maintained with fire that results in an open understory with an oak component. Fox squirrels often use large oaks for nest sites and for daytime refugia. In addition, acorns provide a major part of their diet. Mature longleaf pines that produce seed bearing cones are an important energy-rich food source, particularly during summer. A mosaic of habitat conditions across the landscape ensures a year-round supply of food items that vary seasonally. The fox squirrel is a wide-ranging species and the literature suggests 2,000- 9,000 acres of suitable habitat are required to support a population.

Models indicate 11,699 acres of potential habitat for Sherman's fox squirrels on LWRWEA. Of this, 6,135 acres (52%) of potential fox squirrel habitat are contained within [megaparcel](#)s. With the possible exception of Carter Creek (1,737 acres), land management in

megaparcels is challenging and unlikely to meet the long-term habitat requirements for this species. Furthermore, the mosaic of public land and private residences, particularly in the Leisure Lakes complex, increases the likelihood of mortality from domestic pets, vehicles, or poaching.

Royce Unit and Lake Placid Scrub and McJunkin likely have the most potential to support this species. Royce Unit, Clements and adjacent Highland Park Estates combine to contribute 2,400 acres of potential habitat. Furthermore, fox squirrels may move between Royce Unit and private ranchland to the northeast. Fox squirrels are commonly observed on Royce Unit in and around the pastures at the center of the tract. As a former cattle ranch, Royce Unit has approximately 600 acres of pasture, most of which is bahiagrass. In the past 5 years, staff have planted strips of longleaf pines and clumps of oak trees in the pastures to provide cover and mast for wildlife. The pastures are regularly burned and have native vegetation scattered throughout, particularly those adjacent to the cutthroat seeps. Approximately 70 acres in MU 72 are undergoing GCR to restore native mesic flatwoods. A number of focal species, including sandhill cranes and Sherman's fox squirrels, use the pastures on Royce Unit. Rather than extensive GCR, staff should continue to manage these pastures to provide a mosaic of native oaks and pine interspersed throughout the pasture that enhance the use of these areas by these focal species. Because these pastures do provide some benefit to wildlife, FWC's limited restoration resources are better spent on restoration of xeric uplands rather than on these pastures. The model indicates Lake Placid Scrub and McJunkin contain approximately 3,000 acres of fox squirrel potential habitat. Considering the potential habitat on neighboring private lands and ABS, there is good potential to support fox squirrels in this area.

Management actions that maintain or enhance habitat for fox squirrels include prescribed fire and mechanical actions that aid in restoring natural community structure, and timber management that results in open, mature pine forests with an oak component. As these are planned and ongoing management actions, there is no need for a SMA. Because this species naturally occurs at low densities and can be difficult to detect, no specific monitoring aside from opportunistic observation is recommended ([Section 5.2.5](#)), and there are no measurable objectives. Observations should be reported on FWC's [Fox Squirrel Registry](#). Because there is little occurrence information for fox squirrels on LWRWEA, observations in new areas should be documented.

The area goal is to continue to promote suitable habitat for Sherman's fox squirrels that allows the fox squirrels on LWRWEA to function as part of a regional population. While the continued presence of fox squirrels on LWRWEA may be dependent on conditions affecting the regional population, the surrounding landscape and habitat conditions on select tracts, such as Royce Unit and Lake Placid Scrub, increase the chance of persistence.

3.2.24: Limited Opportunity Species

Five focal species (Burrowing Owl, Crested Caracara, Florida Grasshopper Sparrow, Red-cockaded Woodpecker, Florida Panther) modeled (using statewide data) to have potential habitat on LWRWEA lack reasonable opportunity for management on the area. Opportunistic observations of these species should be documented ([Section 5.2.5](#)). If any of these species are documented with increasing regularity, LWRWEA's role in their conservation and recovery should be re-visited.

Burrowing Owl - While the burrowing owl triggers 4 of 6 prioritization parameters ([priorities table](#)), burrowing owls are not known to occur on LWRWEA. Burrowing owls prefer open, treeless areas with sandy soils and low shrub cover. Historically, this species occurred in dry prairies in Florida, but now are more likely to be found in non-native habitat, such as on berms or spoil banks, in neighborhoods, or agricultural areas. From a regional perspective, KPPSP, approximately 25 miles east of the LWRWEA, is the only place in Florida where burrowing owls still use dry prairie. Burrowing owls occurred on APAFR as recently as 2009 and the FX Bar Ranch in Frostproof in August 2011.

Natural community models identified 1,988 acres of potential habitat for burrowing owls on 10 LWRWEA tracts. Most of this acreage is currently unsuitable for burrowing owls because it is not treeless or the groundcover is too dense. Small areas that may be suitable, such as pastures, are outside the dispersal distance from known burrowing owl locations. While the conditions on LWRWEA are not suitable for this species, a burrowing owl Strategic Habitat Conservation Area (SHCA) is located on private property to the west and south of Lake Placid Scrub and McJunkin. Within the SHCA, the Westby ranch is adjacent to the west of Lake Placid scrub and ABS is adjacent to the east of McJunkin. The Westby ranch was considered for a Development of Regional Impact approximately 2 years ago, but has now applied for a conservation easement. The location and status of burrowing owls within the SHCA near LWRWEA is unknown.

The potential habitat model overestimated the amount of potential burrowing owl habitat on LWRWEA and the area does not have suitable habitat to support burrowing owls; therefore, the burrowing owl is a limited opportunity species on LWRWEA. As such, species-specific monitoring, SMAs, goal and objectives are not recommended. However, if burrowing owls are observed, it should be documented and reported, as well as investigated to determine if burrows are present.

Crested Caracara - Crested caracaras are rarely observed on LWRWEA and have only been documented at Royce Unit, Lake Placid Scrub and Tubbs. Nesting has never been documented on LWRWEA, though the area does fall within the known breeding range of the species.

The crested caracara is federally listed as threatened and triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a high statewide priority. Historically associated with dry prairie systems in central Florida, the majority of the crested caracara population in Florida is now found on private ranchlands. The range of this species has not changed, rather caracaras appear to have adapted to land use changes within their range and currently use pasture that was once dry prairie.

Models indicate 5,054 acres of potential habitat for caracaras on LWRWEA, divided among all tracts except for Lake Blue. Caracaras have relatively large home range sizes (average of 3,000 acres); no LWRWEA tract contains enough potential habitat for even 1 caracara territory. The patchy distribution of potential caracara habitat on LWRWEA, combined with limited observations of the species indicates that LWRWEA functions as occasional foraging habitat. However, Lake Placid Scrub was modeled to have almost 2,000 acres of potential habitat and is adjacent to areas that could be used by caracaras. Royce Unit and Clements were modeled to have 1,043 acres of potential habitat.

Given the limited use of LWRWEA by this species, and because the potential habitat is divided among many tracts, caracaras are a limited opportunity species on LWRWEA. If caracaras are observed more frequently on LWRWEA or adjacent areas, this assessment should be re-visited or revised for future Strategies. If a caracara nest is documented on LWRWEA, land management considerations will be applied ([Section 4.3.8](#)).

Florida Grasshopper Sparrow - The Florida grasshopper sparrow is not known to occur on LWRWEA. While the landcover-based model identified 420 acres of potential habitat for this species, the natural community models identified 0 acres of potential habitat. As the landcover data is known to have issues identifying dry prairie, the area-specific natural community data is the more appropriate model to use.

Florida grasshopper sparrows are endemic to dry prairie habitat in Central Florida and are known to exist only in 4 separate areas: APAFR, KPPSP, Three Lakes WMA and Beatty Ranch. The Florida grasshopper sparrow triggers all 6 prioritization parameters, is federally listed as endangered, and is a high priority species where it is known to occur. However, the lack of potential habitat on the LWRWEA indicates a limited opportunity to contribute to the regional population of Florida grasshopper sparrows. As LWRWEA has no dry prairie and no potential to restore dry prairie, the area has no role in supporting this species. As such, area-specific goals, objectives, monitoring or an SMA would be inappropriate.

Red-Cockaded Woodpecker - Red-cockaded woodpeckers do not occur on any LWRWEA tracts. Models identified potential habitat on the 3 southernmost tracts of LWRWEA (Lake Placid Scrub/McJunkin and Gould Road). From a regional perspective, the nearest known population of red-cockaded woodpeckers occurs on Platt Branch Mitigation Park WEA, in Venus, approximately 12 miles south of Lake Placid Scrub and McJunkin, and 8 miles southwest of Gould Road. Platt Branch is part of the Fisheating Creek metapopulation. The APAFR population is approximately 35 miles to the northeast.

Red-cockaded woodpeckers inhabit open, mature pine woodlands with a diversity of grass, forb, and shrub species. A basal area of 40-80 ft²/acre is preferred. As cavity nesters, individuals excavate cavities in the heartwood of older (typically >60 years) living pine trees. Suitable cavities and potential cavity trees are often the limiting factor for this species. Artificial cavities have been effective in increasing local populations when combined with appropriate habitat management.

The red-cockaded woodpecker is a federally endangered species that triggers 4 of 6 prioritization parameters ([priorities table](#)). An FWC Management Plan and USFWS Recovery Plan have been developed for this species, making it a high statewide priority. The LWRWEA is not referenced in either plan.

Initial models indicated 69 acres of potential habitat on LWRWEA, all of which is on Gould Road. This model only considered potential habitat within 6.2 miles of known locations. Removing this limitation, models identify an additional 2,231 acres of potential habitat on Lake Placid Scrub and 212 acres at McJunkin. Red-cockaded woodpeckers have home range sizes ranging from 100-400 acres per territory. Gould Road is 8 miles to the southeast of Lake Placid Scrub and does not have enough potential habitat to support even 1 red-cockaded woodpecker territory. Lake Placid Scrub and McJunkin have more potential and could support up to approximately 6 territories but populations of less than 20 territories require active management to maintain viability. Overall, the potential habitat for this

species on LWRWEA is marginal. The lack of suitable habitat, isolation from known populations, and surrounding land use indicate that the role of LWRWEA for the red-cockaded woodpeckers is extremely limited. As such, area-specific goals and objectives are unnecessary. If information becomes available that alters the role of LWRWEA for this species, this should be reflected in future Strategies.

Florida Panther - The Florida panther has been documented on or near the Silver Lake/Sun-N-Lake, Carter Creek and Lake Placid Scrub tracts of the LWRWEA. From a regional perspective, panthers are occasionally documented along the Lake Wales Ridge on both conservation and private lands; however, all of the documented sightings are of dispersing males. The LWRWEA is approximately 21 miles north of primary, secondary and dispersal zones for panthers.

The Florida panther triggers 4 of 6 prioritization parameters ([priorities table](#)). These scores, combined with small population size, high likelihood of extinction, and federal listing as endangered make this species a high statewide priority. The Florida panther uses a variety of habitats including forested uplands, freshwater wetlands, dry prairie, old fields, pastures, and agricultural areas. Forested areas are preferred, but panthers use non-forested habitat for hunting and as travel corridors across landscapes.

Considering the distance from the known range of the Florida panther, models indicate no potential habitat available for this species on LWRWEA. If that limitation is lifted, 6,265 acres of potential habitat are available, spread over all tracts except for Lake Blue. The potential for reproduction is low considering females have not been documented north of the Caloosahatchee River. If the Florida panther population continues to expand, LWRWEA may have a role in connecting the panther population in south Florida with areas suitable for territory establishment north of the Lake Wales Ridge. The Lake Wales Ridge falls within habitat linkages identified by Florida Greenways. These greenways connect large tracts of preserved lands throughout Florida, and will be instrumental to any further panther population expansion. Furthermore, the Lake Wales Ridge could play a significant role for this species if predicted sea-level changes occur and the south Florida panther population responds by moving north. The relatively small size of LWRWEA combined with the discontinuous arrangement of tracts does not provide a substantial opportunity to improve conditions for the Florida panther population, but incremental improvements that benefit panthers will assist in recovery efforts. Management on LWRWEA including ongoing efforts to restore and maintain natural community structure and function, and efforts to maintain appropriate bear denning and foraging habitat are compatible with the needs of this species.

Increasing public awareness about panthers on the Lake Wales Ridge could proactively address potential issues should panther habitat use in this region increase. Coordination with the LWREWG ([Section 6.13](#)) and the Imperiled Species Management Section ([Section 6.1.6](#)) for outreach and education regarding panthers is recommended. Even if a panther population is not established on LWRWEA and the area functions only as occasional foraging habitat, public education and outreach is important to minimize conflicts between panthers and people if panthers continue to move across the Lake Wales Ridge.

The current function of LWRWEA for Florida panthers is providing cover for dispersing individuals. The limited use of LWRWEA by this species, makes setting a SMA, area goal, or objective impractical. If individuals are observed, this should be documented

(Section 5.2.5) and shared with the appropriate entities. In the event that breeding panthers are documented outside of the known range for the species, it will be necessary to revisit this evaluation.

3.2.25: Rare Plants

The LWRWEA contains 20 of 22 federally listed plant species known to occur on the Lake Wales Ridge. All LWRWEA tracts contain federally listed plants; Carter Creek alone contains 15 species, which is 2 more species than the much larger ABS. Four other tracts (Holmes Avenue, Lake Placid Scrub, Royce Unit, and Silver Lake) have at least 10 federally listed plant species. In addition, most LWRWEA tracts contain one or more of the 18 state-listed species documented on the Lake Wales Ridge (Table 2). Many of these plants are threatened due to loss and degradation of the habitat, and therefore will benefit from FWC's efforts to use fire to restore natural communities.

Table 2. A summary of the known occurrence of listed plant species on or near LWRWEA. Species in bold are federally listed, non-bold species are state-listed, and species marked with an asterisk are candidates for state listing.

Species	Carter Creek	Clements	Gould Rd	Henscratch 27	Henscratch	Highland Park Estates	Leisure Lakes	Holmes Ave	Lake Blue	Lake Placid Scrub	McJunkin	Messana	Mtn. Lake Cutoff	Orange Blossom	Royce Unit	Silver Lake	Sun-n-Lakes	Sunray	Tubbs
<i>Asclepias curtissii</i>			X		X		X	X	X						X	X		X	
<i>Bonamia grandiflora</i>	X			X				X	X				X		X				
<i>Calamintha ashei</i>	X		X		X	X	X	X		X	X				X	X		X	
<i>Calopogon multiflorus</i>																			
<i>Centrosema arenicola</i>																			
<i>Chionanthus pygmaeus</i>	X		X												X	X			
<i>Chrysopsis delaneyi</i> *	X																		
<i>Chrysopsis highlandensis</i>																			
<i>Cladonia perforata</i>															X				
<i>Clitoria fragrans</i>	X							X	X	X		X	X		X	X		X	

Species	Carter Creek	Clements	Gould Rd	Henscratch 27	Henscratch	Highland Park Estates	Leisure Lakes	Holmes Ave	Lake Blue	Lake Placid Scrub	McJunkin	Messana	Mtn. Lake Cutoff	Orange Blossom	Royce Unit	Silver Lake	Sun-n-Lakes	Sunray	Tubbs
<i>Conradina brevefolia</i>																X		X	
<i>Crotalaria avonensis</i>	X																		
<i>Dicerandra christmanii</i>																			
<i>Dicerandra frutescens</i>						X											X		
<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	X			X						X					X	X			
<i>Eryngium cuneifolium</i>			X			X		X		X	X			X	X				
<i>Euphorbia roscens</i>	X			X		X					X				X	X			
<i>Hartwrightia floridana</i>																			
<i>Hypericum cumulicola</i>	X	X	X		X	X	X	X		X	X				X	X			
<i>Hypericum edisonianum</i>						X	X	X		X	X				X		X		
<i>Illicium parviflorum</i>																			
<i>Lechea cernua</i>				X	X	X	X	X	X	X	X				X	X		X	
<i>Lechea divericata</i>	X				X		X	X											
<i>Liatis ohlingeriae</i>	X	X	X	X	X	X	X	X	X	X	X				X	X		X	
<i>Lupinus aridorum</i>									X										
<i>Matelea pubiflora</i>	X																		
<i>Nolina brittoniana</i>	X	X	X	X	X	X	X	X	X	X			X		X	X		X	
<i>Panicum abscissum</i>	X			X	X	X	X	X		X	X	X		X	X	X			X

Species	Carter Creek	Clements	Goold Rd	Henscratch 27	Henscratch	Highland Park Estates	Leisure Lakes	Holmes Ave	Lake Blue	Lake Placid Scrub	McJunkin	Messana	Mtn. Lake Cutoff	Orange Blossom	Royce Unit	Silver Lake	Sun-n-Lakes	Sunray	Tubbs
<i>Paronychia chartacea</i> spp. <i>Chartacea</i>	X	X	X	X	X	X	X	X	X	X	X		X		X	X		X	
<i>Polygala lewtonii</i>	X																		
<i>Polygonella basiramia</i>	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X	X
<i>Polygonella myriophylla</i>	X	X	X	X	X	X	X	X	X					X	X	X		X	
<i>Prunus geniculata</i>	X		X	X	X			X		X		X			X	X		X	
<i>Pteroglossaspis ecristata</i>									X										
<i>Rhynchospora megaphumosa</i>																			
<i>Schizachyrium niveum</i>	X	X	X	X	X	X	X	X	X				X		X	X	X		
<i>Stylisma abdita</i>	X			X		X	X				X		X		X	X	X		
<i>Warea amplexifolia</i>																			
<i>Warea carteri</i>	X			X					X	X	X								
<i>Ziziphus celata</i>	X																		

ABS Plant Lab staff conduct rare plant monitoring on LWRWEA. FWC staff coordinates with ABS annually regarding planned land management activities and ABS research on LWRWEA, and as needed to assist with plant research and monitoring activities on LWRWEA. Area staff does not conduct independent plant monitoring or research; however, the presence of rare plants is a consideration during land management planning. For example, protection of the Florida ziziphus population at Carter Creek was a priority during a hardwood control project. Furthermore, some heavy equipment such as roller choppers or skidders are not used on LWRWEA for habitat management and restoration work because of the potential impact to rare plants. Because of its low impact to soils, the Gyrotrac is the primary equipment used for mechanical treatment on LWRWEA.

In order to address federal Recovery Plan guidelines for select plant species, ensure adequate protection on LWRWEA tracts for federally and state-listed plant populations, and identify how area staff can assist in ongoing ABS research and monitoring on LWRWEA tracts, development of a Rare Plant Management Plan is recommended. Area staff and the

Conservation Biologist will work with ABS Plant Lab ([Section 6.10](#)) to develop the Plant Management Plan.

The area goal is to promote long-term persistence of imperiled plant species by providing appropriate habitat. The measurable objective is to:

- 1) Develop a LWRWEA Rare Plant Management Plan by the end of 2013.

3.2.26: Other Focal or Imperiled Species

The American alligator (*Alligator mississippiensis*) is the only other listed wildlife species documented on LWRWEA. Ongoing management to maintain healthy wetland habitats should ensure the continued existence of the alligator on LWRWEA.

Florida Bonneted Bat - The FWC lists the Florida bonneted bat (*Eumops floridanus*) as endangered, and the species is a candidate for federal protection. It is not known to occur on LWRWEA, however, the 2008 discovery of the species along the Kissimmee River opens the possibility that it could be present but undetected on the Lake Wales Ridge. Very little is known about this exceedingly rare species; however, it has been documented using artificial roost structures. As a follow up to the 2008 bat surveys, staff installed a number of triple-chambered bat houses on LWRWEA to provide roosts for non-imperiled bat species such as the Brazilian free-tailed bat and eastern pipistrelle. Two single-chambered bat houses specifically designed to accommodate bonneted bats were installed at Royce Unit in 2008, under guidance from the Florida Bat Conservancy ([Section 6.7](#)). Further action may be necessary if bonneted bats are documented on the Lake Wales Ridge.

Endemic Arthropods - Research by the Entomology Lab at ABS suggests the number of arthropods endemic to scrub is larger than what was previously believed. ABS suggests 70 or more species of scrub arthropods are endemic and FWC's Florida Wildlife Legacy Initiative identifies several of these as SGCN. ABS, using funds from the State Wildlife Grant program, conducted a species inventory at approximately 20 protected scrub sites on the Lake Wales Ridge, including several LWRWEA tracts. The results will be used to identify possible candidates for listing, and obtain natural history information. The Highlands tiger beetle (*Cincindela highlandensis*) is a rare scrub arthropod found only in Polk and Highlands counties. This species is a candidate for federal protection and is one of many arthropod species dependent on scrub and sandhill habitats on the Lake Wales Ridge. Some of these species have incredibly narrow macro- and micro-habitat requirements. Ongoing land management actions on LWRWEA are assumed to be compatible with the needs of most of the endemic arthropods, given what is currently known about the natural history of these species. LWRWEA staff will communicate with ABS Entomology Lab staff to discuss if this continues to be the case as natural history information is learned about individual arthropod species ([Section 6.10](#)).

It is possible other imperiled species occur on LWRWEA, and if encountered staff will document these encounters. Imperiled species on LWRWEA should continue to benefit from FWC's ongoing management actions that aim to restore natural communities' structure and function. Florida's imperiled species are adapted to these natural communities and have a higher probability of persistence under FWC management actions than in the absence of management.

Section 4: Land Management Actions and Considerations

Models identified potential habitat for 28 focal species on the area ([Section 3.1](#)); however, not all of these species have the same level of management opportunity or need ([Section 3.2](#)). The FWC's natural community-based management, which emphasizes frequent growing season prescribed fire and appropriate scrub management, will promote the habitat conditions necessary for most of these species, without the need for further strategic management actions.

However, we may designate SMAs when actions over and above ongoing natural community management are required ([Section 4.1](#)) in a specific location. In order to ensure natural community management addresses the needs of these focal species, the OBVM DFCs are evaluated ([Section 4.2](#)). Some species have specific protective measures or land management considerations that are necessary to ensure their continued use of the property. [Section 4.3](#) provides these recommendations.

4.1: Strategic Management Areas

While the intent on LWRWEA is to restore all restorable natural communities to a more natural condition that will better suit these species, SMAs allow focus on areas with the highest possibility of success and or areas most critical for the conservation of a species on the area. Staff designates SMAs to achieve at least one of the following:

- Identify the area in which to apply specific land or species management that creates the highest probability for persistence and conservation of a species or suite of species. These specific actions should aid in restoring, enhancing or maintaining the habitat or population.
- On areas with more restoration and enhancement than can be accomplished in short order, identify an area in which to focus specific land or species management actions for the best chance of success. This might be the first or next step in a sequential series of management actions that will increase the likelihood of occupation and or persistence of a specific species.
- Identify an area that is so critical to the persistence of a species on the area that it warrants identification to ensure protection against negative alteration.
- Identify areas that are more critical for research or monitoring.
- Recommend OBVM DFCs in a specific area to benefit a particular species when we would not want to change the DFCs in the natural community area-wide.

The workshop participants agreed on the need for a SMA to identify an area critical to the persistence of black bear; the black bear population sub-center that occurs on the Clements tract of LWRWEA. Staff developed a SMA-specific goal and strategy to guide management. We define goals, objectives and strategies in [Section 1](#).

4.1.1: Florida Black Bear Population Sub-Center Protection SMA

The purpose of this SMA is to ensure staff knowledge of and to document the importance of an area that has been identified as critical to the persistence of black bear; the black bear population sub-center that occurs on the Clements tract of LWRWEA. In the

Glades-Highlands bear population, telemetry studies have identified 3 population sub-centers where adult female home ranges are clustered. A significant portion of one of these sub-centers is located on the Clements tract of LWRWEA. The area used as this sub-center contains a dense, forested baygall adjacent to basin marsh, scrub, and scrubby and mesic flatwoods ([Figure 1](#)). By ensuring the continued integrity of this area, we will facilitate protection of denning habitat within the SMA and ensure the area continues to function as a black bear population sub-center.

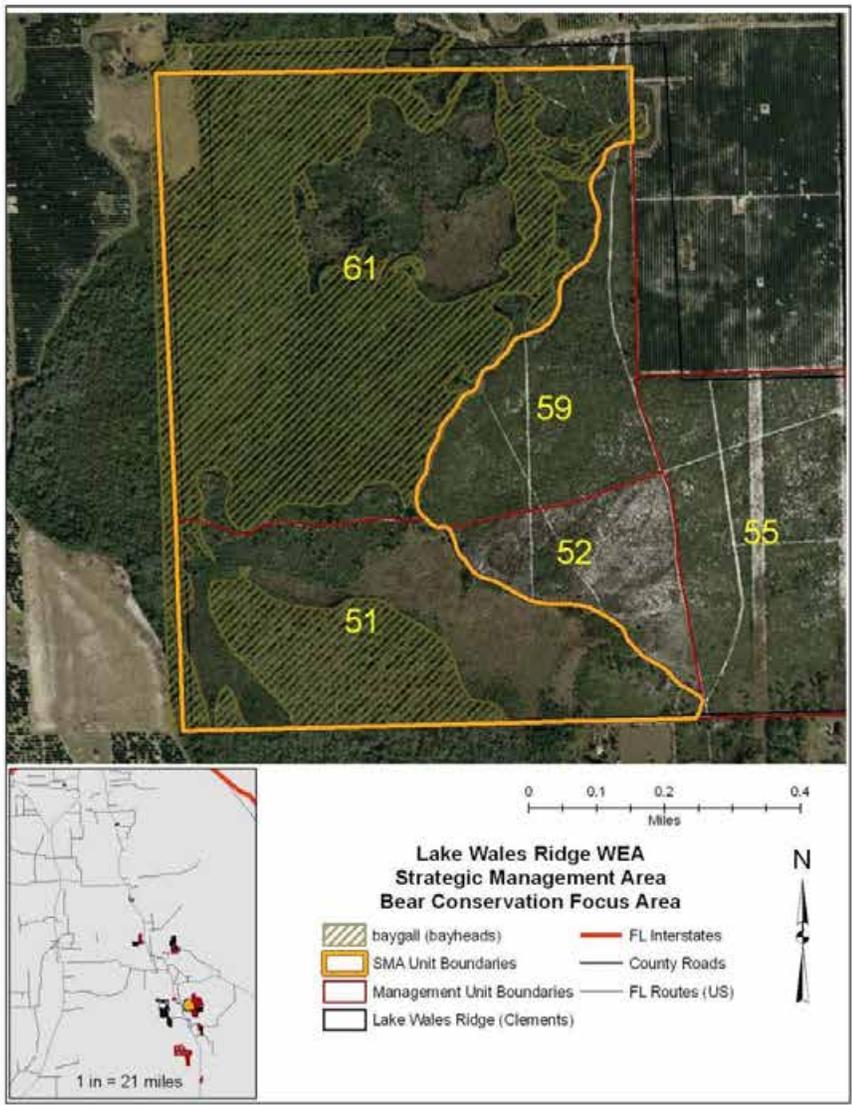


Figure 1: Management units on the Clements tract identified as critical to the persistence of the Florida black bear on the LWRWEA.

SMA Goal: Allow the area to continue to function as a black bear population sub-center.

Description of the SMA: This SMA contains 215 acres of baygall natural community in MUs 51 and 61.

Strategy: By designating this area as a SMA, we will ensure future managers are aware of the importance of this area to the black bear. Baygall is not an actively-managed natural community on LWRWEA, and therefore will not be directly affect by management. However, it is possible management in adjacent natural communities could have a negative influence on the suitability of the area, if the needs of the bear are not considered. To enhance the suitability of this area, staff will continue to provide for the needs to bears during prescribed fire activities in natural communities adjacent to the baygall. This includes avoiding burning ecotones along the baygall during the bear denning season (December – April) to avoid direct mortality to denning bears and cubs. Staff will continue to coordinate with bear researchers at ABS and FWC’s Bear Program to ensure the needs of black bears are met on LWRWEA and within this SMA. While staff will affect measures to protect the integrity of the habitat in this SMA, the continued presence of this species in the SMA is dependent on conditions that influence the regional population.

4.2: Objective-Based Vegetation Management Considerations

Staff will use OBVM to monitor progress towards DFCs of various natural community parameters (Table 3). As such, OBVM will be effective in monitoring progress towards land management strategies.

The OBVM DFCs target a range in values for various habitat parameters within actively managed communities. However, some focal species require a more restricted range in habitat parameters than is reflected in the DFCs. Therefore, we suggest which parameters should be modified if habitat parameters important to a particular species require a change in the DFC area-wide (Section 4.2.1). Workshop participants recommended that in scrubby flatwoods, the DFC of basal area should be modified to better meet the needs of the scrub-jay.

4.2.1: Modifications to Desired Future Conditions

Scrubby Flatwoods

Basal Area (sq. ft./acre)

All management units: change from ≤ 40 sq. ft./acre to ≤ 10 sq. ft./acre

Justification: The scrubby flatwoods are important for Florida scrub-jays, and as pine basal area increases, the suitability of the habitat for scrub-jays decreases. Modifying the DFC for this parameter will ensure management is successfully maintaining the habitat in a condition that is suitable for Florida scrub-jays on LWRWEA.

Table 3. Desired Future Conditions for specific vegetative parameters in actively managed natural communities at LWRWEA as identified via the OBVM workshop process.

Scrubby Flatwoods	Mesic Flatwoods
Basal Area: ≤40 sq. ft./ac.	Basal Area: 20-60 sq. ft./ac.
Palmetto Cover: 10-40%	Palmetto Cover: 10-50%
Shrub Cover: 50-80%	Avg. Max. Shrub Height: ≤ 5 ft.
Avg. Max. Shrub Height: 3-7 ft.	Total Herb Cover: 25-75%
Total Herb Cover: 10-30%	Total Shrub Cover: 10-50%
Bare Ground: 10-50%	Weedy Cover: ≤5%
Weedy Cover: ≤10%	Exotics: 0%
Exotic Cover: 0%	
Sandhill	Wet Flatwoods
Pine-only Basal Area: 20- 60 sq. ft.	Basal Area: 20-60 sq. ft./ac.
Hardwood Stem >6 ft. Density: 5-15 stems/acre	Palmetto Cover: ≤10%
Sand Pine Stem Density: 0 stems/acre	Avg. Max. Shrub Height: ≤ 6 ft.
Palmetto Cover: 0-25%	Herb Cover: 50-100%
Herb Cover: 25-75%	Total Shrub Cover: ≤40%
Shrub Cover: 10-35%	Weedy Cover: ≤5%
Avg Max Shrub Ht: ≤5 ft	Exotics: 0%
Bare Ground Cover: 5-15%	Cutthroat Grass Cover: 0-100%
Weedy Cover: ≤ 5%	
Exotics: 0%	Seepage Slope
	Basal Area: ≤10 sq. ft./ac.
Scrub	Tree Stems ≤6ft. Density: 0-2 stems/ac.
Basal Area: ≤ 5%	Tree Stems ≥6 ft. Density: 0-2 stems/ac.
Avg. Max. Shrub Ht.: 3-7 ft.	Weedy Cover: ≤1%
Shrub Cover: 40-80%	Exotics Cover: 0%
Bare Ground: 10-50%	Cutthroat Grass Cover: 50-100%
Weedy: ≤10%	
Exotics Cover: 0%	

4.3: Further Land Management Considerations

Most generalist or wide-ranging species will benefit from management that restores the natural structure and function of natural communities they use. However, for some species, specific management recommendations and precautions are necessary to ensure the continued suitability of the area for the species. The following recommendations should help ensure LWRWEA continues to fulfill its role in the conservation of these species.

4.3.1: Gopher Frog

Gopher frogs frequently move between wetland breeding ponds and adjacent uplands. Do not place new firebreaks or roads along wetland ecotones because they can alter or destroy the herbaceous component of pond margins preferred by this species and other amphibians. Wet-lining can be an alternative to mineral firebreaks around wetlands if necessary; however, it is preferable to allow fire to burn through the wetland. Use prescribed

fire as the primary tool to remove shrubs and other thick vegetation from pond margins; use mechanical and chemical treatments sparingly to reduce effects on pond-breeding amphibians. Because it is important to maintain potential breeding ponds in good condition, minimize soil disturbance within 500 yards of potential breeding ponds.

Growing season (April–September) burns, preferably after April, are more beneficial to the gopher frogs than dormant season (October–March) burns. This is because they are more effective at reducing shrub cover and litter in the wetland basin, stimulating the growth of herbaceous emergent vegetation, enhancing the wetland to upland ecotone, and stimulating the reproduction of wiregrass in the surrounding uplands. The most beneficial time to burn is when the wetland is dry. While growing season fires are preferred, a burn during dormant season is preferable to not burning.

4.3.2: Eastern Indigo Snake and Florida Pine Snake

Large upland snakes such as the eastern indigo and Florida pine snake are relatively wide ranging and elusive. Ongoing land management activities will enhance the suitability of habitat for this species but could also be directly detrimental. When using heavy equipment during land management activities, it is important to avoid direct mortality, if possible. When practical, keep heavy equipment at least 25 feet from areas with a high density of pocket gophers or gopher tortoise burrows, as pine snakes regularly use their burrows and forage on the gophers. In general, avoid removing stumps and leave coarse woody debris and residual stumps intact, when possible, to provide cover for these species. While it is acceptable to pile and burn excess logging slash if necessary, ensure some debris remains in the stand to provide cover for these species. Creating brush piles can provide cover for these species if escape cover is lacking.

4.3.3: Gopher Tortoise

In areas where gopher tortoises occur, the timing of mechanical treatments should occur, when appropriate, during the dormant season to minimize negative impacts to gopher tortoises. Gopher tortoises are generally less active and remain in burrows during the winter months; therefore, mechanical equipment at this time will be less likely to crush or otherwise harm foraging tortoises. Because it is difficult for equipment operators to see hatchling tortoises and hatchlings are most abundant during September and October, avoid mechanical treatments during these months when practical. However, also consider how timing of the treatment will affect management results, as growing season treatments frequently are more successful in creating the diverse groundcover required by the gopher tortoise. Regardless of timing, make efforts to minimize impacts to known burrows, whether active, inactive, or abandoned.

4.3.4: American Swallow-Tailed Kite

Because swallow-tailed kites exhibit high nest site fidelity, protect known nest sites from disturbance and alteration, and retain all of the tallest pines in the area of nest sites. Maintaining a 330-foot protective buffer around active nests during nesting season should minimize the chance of disturbance. When possible, kite nesting areas should be managed to

have a higher shrub height and density than surrounding areas as this may reduce the likelihood of nest predation. If kite activity is observed during nesting season, particularly if kites are observed carrying nesting material, mobbing, or congregating in groups of 3 or more, document this information and try to locate the nest. For information on how to locate nests, see:

Meyer, K. D., and M. W. Collopy. 1995. [Status, distribution, and habitat requirements of the American swallow-tailed kite \(*Elanoides forficatus*\) in Florida](#). Project Report, Florida Game and Fresh Water Fish Commission, Tallahassee, Florida, USA.

While kites have not been documented nesting on LWRWEA, it is important to preserve future potential nest trees. This can be done by retaining the largest, oldest trees on the landscape during land management activities.

4.3.5: Bachman's Sparrow

Prescribed fire improves habitat quality for Bachman's sparrows, and is the primary land management tool recommended to promote habitat for this species on LWRWEA. Suitable habitat can be created and maintained through frequent (≤ 3 year rotation) use of prescribed fire in sandhills and flatwoods. The occurrence of fire is critical to sustaining this species as use of an area by Bachman's sparrows declines rapidly around 18 months post-fire, and the species may abandon habitat if fire is excluded for more than 3 years. Because males use small shrubs as singing perches, apply the 'sloppy chop' technique when using mechanical treatments to reduce understory. Follow mechanical treatment with a prescribed burn.

4.3.6: Brown-Headed Nuthatch

Brown-headed nuthatches have not been documented on LWRWEA and current conditions are not optimal. However, management can be applied to increase habitat suitability, which will increase potential for future occupation by the species. This cavity-nesting species is dependent on the presence of snags for suitable nesting habitat. As such, retain snags during land management activities and evaluate the affect of management activities on snags to ensure that new snags are replacing consumed snags. Old short snags with flaking bark and soft wood and old decaying oaks with a diameter at breast height of < 10 inches are important nesting sites for this species. Take care to retain these particular types of snag.

If brown-headed nuthatches are documented in a specific MU, an effort should be made to avoid prescribed fire during February and March in the MU. The loss of nests early in the season frequently results in re-nesting attempts, and most re-nesting occurs during periods of increased snake activity which results in greater predation on nesting females, their eggs, and young. However, if this is the only time in which suitable conditions occur for a burn, it is better to burn than to avoid burning.

4.3.7: Cooper's Hawk

During the nesting season (April-July), Cooper's hawks are secretive and intolerant of human disturbance near the nest site. Males show a strong fidelity to traditional territories. For this reason, protect known nests from disturbance during land management activities by maintaining a 50-foot buffer around the nest during the nesting season. When practical, avoiding heavy alteration of the habitat surrounding the nest. Whenever signs of Cooper's hawk nesting (e.g., carrying nesting material, aggressive dive bombing) are encountered, document the location and make an effort to protect the nest site.

4.3.8: Crested Caracara

Caracaras have high fidelity to their home ranges and nesting sites; efforts should be made to protect nesting sites and maintain foraging habitat within occupied territories. Management actions like mowing and prescribed fire will improve habitat conditions by creating areas with low ground and shrub cover. However, increased human activity should be avoided within 1,000 feet of the nest during the first 2-3 weeks of nesting, as this is when adults are most likely to abandon a nest due to disturbance. To ensure management is conducive with the needs of this species, follow the management guidelines found at:

Morrison, J.L. 2001. [Recommended Management Practices and Survey Protocols for Audubon's Crested Caracara \(*Caracara cheriway audubonii*\) in Florida](#). Florida Fish and Wildlife Conservation Commission, Technical Report No. 18. Tallahassee, Florida, USA.

4.3.9: Florida Sandhill Crane

Prescribed fire improves the quality of upland habitat for this species. In known nesting areas, fires should occur outside of the nesting season (December - June) and after the young are able to fly. A 400-foot buffer around known nests should reduce the likelihood of disturbance, which decreases chances of abandonment or other negative impacts. Consider seasonality of wetland management activities to avoid flooding of nests or reductions in foraging habitat. To ensure management is consistent with the needs of this species, follow the management guidelines found at:

Stys, B. 1997. [Ecology of the Florida sandhill crane](#). Florida Game and Fresh Water Fish Commission, Nongame Wildlife Program Technical Report No. 15. Tallahassee, Florida, USA.

4.3.10: Florida Scrub-Jay

Manage scrub and scrubby flatwoods using methods that ensure the availability of a mosaic of habitat conditions in a small area, as described in the [FWC's Scrub Management Guidelines](#). These habitats mature and become thick and unsuitable for scrub-jays if left unmanaged. Prescribed fire that is patchy, leaving some unburned patches, benefits scrub-jays. Where open sand is limited, chemical or mechanical treatments, or pile burns can help create

open patches of sand. Make use of the 'sloppy chop' technique when applying mechanical treatments.

4.3.11: Northern Bobwhite

The primary land management tool used to benefit northern bobwhite is the frequent use of prescribed fire. Ignite fires using a variety of firing techniques and environmental conditions with the goal of promoting a mosaic burn. Mosaic burns result in a patchwork of burned and unburned areas that meet different life history requirements for northern bobwhite. Growing season fires are generally preferred as they trigger flowering and viable seed production in many native species. Recent evidence suggests that the frequency of fire in flatwoods communities may be just as important as the seasonality of burn. Thus, if growing season burns do not occur, it is better to burn the unit during the following dormant season rather than waiting until the following summer. In general, smaller burn units (50–200 acres) are preferred over larger burn units (>1,000 acres) to provide habitat diversity.

Pine stands with basal areas >70 ft²/acre should be thinned to trigger herbaceous growth and improve habitat conditions for this species. Ruderal areas can be managed for northern bobwhite through mechanical actions like mowing and or disking strips during the summer months to promote herbaceous growth.

4.3.12: Short-Tailed Hawk

Short-tailed hawks exhibit high nest site fidelity, and nest areas are used for multiple years, even if not active every year. Nests of this species are difficult to locate and monitor. If nest sites are located, protect active nests from disturbance by maintaining a 330-foot buffer around the nest during the nesting season. Protect the integrity of the entire nest site by avoiding heavy alteration of the nesting location. Protect potential future nest trees by retaining the largest, oldest trees on the landscape during land management activities. Report new nests to ARCI ([Section 6.6](#)).

4.3.13: Southeastern American Kestrel

Southeastern American kestrels are dependent on the occurrence of open upland habitats that contain a number of snags for nest sites and perches. While ongoing management will encourage the open foraging condition this species requires, make an effort to retain large snags during land management activities. The practice of snag management (i.e. protecting snags when safe and practical, promoting the creation of new snags in areas currently lacking) will benefit southeastern American kestrels. If nesting is documented, minimize the amount of mechanical activity within 500-feet of the nest during the nesting season and protect the snag during prescribed fire activities. For more information on management for kestrels, see:

Stys, B. 1993. [Ecology and habitat protection needs of the southeastern American kestrel \(*Falco sparverius paulus*\) on large-scale development sites in Florida](#). Florida Game and Fresh Water Fish Commission, Nongame Wildlife Program Technical Report No. 13. Tallahassee, Florida, USA.

4.3.14: Southern Bald Eagle

State and federal law requires protection of bald eagles, including avoiding disturbance of nesting eagles. Managers will follow the management guidelines in the [state management plan](#) when planning activities within 660-feet of known eagle nests. Any new nests that are located will be documented. As this species is surveyed on a statewide basis, the [bald eagle nest locator](#) will be checked annually to determine if any new nests are detected via the survey. It is undesirable to have unnaturally dense stands around eagle nests. Continue to manage stands in which eagle nests occur, but avoid negative impacts to the eagles per the guidance of the management plan. During management activities, retain large, mature pines as potential future eagle nesting sites.

4.3.15: Wading Birds

It is possible that ongoing actions (e.g., prescribed fire, timber harvest) could have negative impacts on wading birds if the needs of the species are not considered during the planning of these actions. During the nesting season, providing a 330-foot buffer around nesting colonies will ensure adequate protection. Additionally, plan any mechanical or chemical control of aquatic vegetation at a time that avoids disturbance to the colony, and use methods that do not damage the plants where nests are constructed.

4.3.16: Florida Black Bear

Bears require large areas of dense vegetation for escape and denning cover. They also require a mosaic of dense and edge habitat, in both uplands and wetlands, which provides seasonally abundant forage. Efforts to restore flatwoods and sandhill to more open landscapes with reduced tree density, lower shrub height, and reduced shrub cover may reduce denning and escape cover for bears. Efforts to restore natural communities in pasture and abandoned agricultural fields may increase forage availability and escape cover.

Land management activities that provide a mosaic habitat structure, particularly with multi-aged palmetto patches, will provide escape cover and foraging habitat for bears. Bears are particularly dependant on older stands of palmetto for den sites. Non-actively managed natural communities and the number and interspersed wetland habitats associated with managed natural communities will ensure LWRWEA always provides suitable connectivity habitat for bears. During the planning of land management activities on LWRWEA, consider methods that provide and protect travel corridors for bears within the WEA and across boundaries to other managed areas. Where denning has been documented, limit mechanical and prescribed fire activities during the denning season (mid-December-mid-April). During mechanical treatment along the transitional zone between hardwood swamps and uplands, retain patches of dense vegetation to provide foraging cover for bears and suitable den sites during wet years. Preserve connectivity between cypress heads, depressional wetlands and hardwood swamps to allow bears to move across the area with appropriate cover.

Section 5: Species Management Opportunities

The focal species approach taken here represents a science-based approach to ecosystem management. Though this method relies on a suite of individual species, land management actions focused on these species directly benefit associated species. For some species, land management actions alone are insufficient in aiding recovery. These include species that are not present on a site, have limited dispersal capabilities, or are unlikely to occupy a restored site without reintroduction. Additionally, species-specific management may be required for species that are currently present at low densities, have low reproduction potential, or have other limitations that inhibit recovery. This section provides species management recommendations ([Section 5.1](#)) as well as monitoring recommendations ([Section 5.2](#)) to assess species response to land management and to determine the need for additional species management. [Section 5.3](#) identifies research necessary to guide future management.

5.1: Species Management

Species management as used here refers to non-monitoring actions taken for a specific species. It can include actions such as translocation, restocking, installing artificial cavities, etc. [Section 5.2](#) covers monitoring related actions, including banding or tagging. [Section 2](#) and [Section 4](#) provide information on land management actions, such as prescribed fire or mechanical treatments.

5.1.1: American Swallow-Tailed Kite Nesting Platforms

American swallow-tailed kite nesting platforms have been used to attract nesting kites to areas with appropriate habitat in Florida and Georgia. The ARCI has conducted research on the use of nesting platforms and feels it may be appropriate to install nesting platforms at Lake Placid Scrub. The purpose of this species management action is to attract swallow-tailed kites to an area with potential nesting habitat that could support a nest colony, and encourage nesting. Lake Placid Scrub was selected for installation of nesting platforms because an existing swallow-tailed kite nest is located on adjacent private lands. Establishing nesting on Lake Placid Scrub affords more long-term protection, which is critical for a species with high nest-site fidelity, such as swallow-tailed kites. Area staff and the conservation biologist will work with ARCI ([Section 6.6](#)) to assess Lake Placid Scrub and evaluate the potential for kite nesting platforms. This assessment may expand to include other LWRWEA tracts where appropriate.

5.1.2: Florida Scrub-Jay Translocation

Translocation is a potentially useful tool for scrub-jay conservation and could promote the persistence of metapopulations by increasing population size and connectivity. Translocation could be used to reintroduce scrub-jays into areas where they have been extirpated, or to augment an existing population. Habitat management should be the priority for scrub-jay conservation, but translocation could be an important tool for ensuring viability in the long-term. The USFWS and the FWC developed [Florida Scrub-jay Translocation](#)

[Guidelines](#) to provide minimum standards for translocation. Scrub-jay translocation is not yet considered a routine action and is not appropriate in all situations. On LWRWEA, scrub-jay translocation may be needed to augment the population at Carter Creek. Translocation of birds from declining megaparcels to areas that staff can manage effectively may increase the chance of scrub-jay persistence on LWRWEA. Translocation on LWRWEA would be a combined effort between FWC and other conservation organizations and researchers. If translocation is identified as a necessary species management action on LWRWEA, staff will develop a translocation plan that identifies appropriate actions and sets appropriate project objectives, prior to initiating translocations.

5.1.3: Southeastern American Kestrel Nest Box Program

Staff installed southeastern American kestrel nest boxes in May 2008 on LWRWEA; occupancy occurred only at Silver Lake during the first breeding season following installation. These boxes are maintained and monitored by area staff according to protocol developed by FWRI. The FWRI project is part of a statewide effort to erect and monitor southeastern American kestrel nest boxes and collect data on habitat structure near successful boxes to gain a greater understanding of preferred nesting habitat. As monitoring identifies the need, staff will erect, maintain and monitor new nest boxes. The goal of the southeastern American kestrel nest box program on LWRWEA is to promote nesting opportunities for this species on the area.

5.2: Species Monitoring

Monitoring is critical to evaluating the impact of the management actions described in this Strategy. While we are unable to monitor all of the focal species on LWRWEA, the recommended monitoring will assess species in all actively managed communities. Monitoring of selected wetland-dependent species, as well as opportunistic monitoring of uncommon or hard to monitor species is also included. Data collected will be reported to the regional conservation biologist for inclusion in the appropriate database. We will make monitoring data available to cooperating agencies and organizations such as FNAI ([Section 6](#)).

This section provides the list of monitoring actions recommended for the area, and provides the purpose for the monitoring. The FWC is in the process of standardizing monitoring protocols for a number of these species. Approved protocols are available at the [WCPR SharePoint Site](#). When protocols are finalized, they will be implemented in accordance with the timeframe described in this Strategy.

5.2.1: Gopher Frog Monitoring

Gopher frogs require xeric uplands that have associated ephemeral wetlands. Because staff uses mechanical treatments to enhance natural communities, it would be beneficial to monitor gopher frogs to ensure treatments are having the desired beneficial effect on this species. The purpose of surveying for gopher frogs is to document the location of breeding ponds and to verify continued use of the area by this species. There are 2 protocols for documenting presence of gopher frogs. Because the gopher frog has a distinct breeding

call, it is possible to confirm gopher frog presence at breeding ponds during appropriate conditions. The second approach involves the use of dip nets to capture gopher frog tadpoles. Baseline monitoring using dip-netting, call surveys, or a combination of both techniques is recommended to document the presence of gopher frogs on LWRWEA. Because FWRI is currently conducting dip-net surveys for a number of xeric upland dependent amphibians, there is potential to work with FWRI in surveying potential breeding ponds on LWRWEA. Once the FWRI grant is complete, it may be more practical to conduct call surveys. Staff resources would be required to coordinate and train Ridge Rangers, and the gopher frog call monitoring protocol is dependent upon specific weather events. Coordination between FWRI ([Section 6.1.4.](#)), FWC's Ridge Ranger Coordinator ([Section 6.1.9](#)), and local staff will be required to accomplish gopher frog monitoring.

5.2.2: Bachman's Sparrow Monitoring

Bachman's sparrows have been identified as 'indicator' species; species whose continued presence is an indicator of good upland pine communities. The purpose of monitoring Bachman's sparrows is to establish a baseline and track relative abundance and distribution of the species across the area over time to ensure management is having the desired effect. Bachman's sparrows occur at Royce Unit and Lake Placid Scrub. Surveys for Bachman's sparrow will use a protocol currently under development that includes standardized point counts and callback tapes. On Royce Unit and Lake Placid Scrub, Bachman's sparrow surveys will occur on an annual basis. Area staff may expand these surveys as habitat suitability increases on other tracts, or if Bachman's sparrows are observed in areas where they were previously not known to occur. Data will be reported to the conservation biologist.

5.2.3: Florida Scrub-Jay Monitoring

The purpose of monitoring scrub-jays on LWRWEA is to track the number of family groups through time. Knowing the location of scrub-jay family groups and how scrub-jays are responding to management helps inform management decisions. Scrub-jays are monitored on LWRWEA by ABS and the Jay Watch Program, a citizen-science based monitoring effort, following a standardized monitoring protocol. Jay Watch currently monitors scrub-jays at 7 tracts (Silver Lake, Sun-n-Lakes, Royce Unit, Clements, Highland Park Estates, Holmes Avenue and Gould Road). ABS monitors scrub-jays at 10 tracts (Silver Lake, Sun-n-Lake, Carter Creek, Royce Unit, Clements, Highland Park Estates, Holmes Avenue, Leisure Lakes, Lake Placid Scrub and McJunkin). Six of the tracts monitored by Jay Watch are monitored periodically by ABS to evaluate the accuracy of citizen-science based data collection.

FWC staff assists with Jay Watch monitoring by helping to train and transport volunteers, marking survey points, coordinating survey dates, and participating in surveys as needed. LWRWEA staff will continue to work with the Jay Watch Program ([Section 6.12](#)) and ABS ([Section 6.10](#)) to conduct scrub-jay monitoring on LWRWEA, evaluate the results of monitoring and plan appropriate land management for scrub-jays. Ensuring funding and resources are available annually to conduct monitoring by Jay Watch and ABS is essential to gauging the progress of land management actions on LWRWEA. If the Jay Watch program

is not funded in the future, area staff will need additional resources to continue monitoring Florida scrub-jays on LWRWEA using the same monitoring protocol.

5.2.4: Southeastern American Kestrel Nest Box Monitoring

The purpose of monitoring kestrel nest boxes is to determine the extent of nesting by southeastern American kestrels on LWRWEA, and to track nesting in boxes over time. Staff will conduct southeastern American kestrel monitoring according to protocol developed by FWRI. Data will be reported to the conservation biologist for submission to FWRI as part of the statewide study ([Section 6.1.4](#)).

5.2.5: Opportunistic Monitoring Opportunities

The purpose of opportunistic monitoring is to document the presence of specific species. Opportunistic monitoring is the process of recording important information as it is encountered. By following the standardized monitoring protocol, staff ensures their data are compatible with other opportunistic observation. Documentation of opportunistic sightings including species, date of the observation, observer, approximate lat/long or appropriate MU, number of individuals, behavior, and habitat type should be forwarded to the regional conservation biologist. Monitoring data will be made available to cooperating agencies and organizations such as FNAI ([Section 6.8](#)). Record encounters or sign of the following focal species:

- Eastern indigo snake
- Florida pine snake
- American swallow-tailed kite (aggregations of 3 or more birds on regular basis in one area during spring and any nesting activity)
- Florida burrowing owl
- Florida mottled duck (nesting females or females with juveniles)
- Florida sandhill crane (nesting and/or presence of flightless young)
- Cooper's hawk (only if exhibiting nesting or breeding behavior)
- Crested caracara
- Short-tailed hawk (also record color phase)
- Southern bald eagle (record and report new nests)
- Wading bird colonies
- Florida black bear (females or cubs anywhere, or bears outside the range)
- Florida panther
- Sherman's fox squirrel (only when in areas not previously found)
- Any listed species that does not have a monitoring protocol in this section.

5.3: Species Research Needs

Species management recommendations in other sections of this document are based on the most current information regarding management strategies for a given species. However, cases arise when little or no information is available to guide management and research is needed to make science-based recommendations. At the WCPR workshop for the

LWRWEA, no species research needs were identified. However, a number of the focal species that have not been documented on LWRWEA may not be able to naturally re-colonize the area. Therefore, research on methodology for successful reintroduction of certain focal species may be needed in the future if we desire to restore these species to LWRWEA. Further, many of these focal species do not have standard monitoring protocol. Research is needed to determine the most efficient means of monitoring these species.

Section 6: Intra/Inter Agency Coordination

Throughout the WCPR process, there were many recommendations regarding possible management strategies for focal species. THCR staff can accomplish most of the proposed management actions; however, cases may arise when coordination with other FWC sections or other agencies is necessary or increases efficiency. This section identifies when coordination is necessary outside of THCR, identifies the entity to coordinate with, and provides position contacts for these entities.

We attempt to provide the name, position and contact information for the people holding the position when this Strategy is drafted. As positions experience turnover, when in doubt, contact the current Section Leader /supervisor to determine the appropriate individual.

6.1: Florida Fish and Wildlife Conservation Commission

6.1.1: Species Conservation Planning Section (SCP)

Monitoring animal populations on a WMA/WEA gives managers a way to gauge animal response to management. If this information is not shared with others, valuable data that can be used to assess statewide conservation efforts is often lost. Managers will share monitoring data with the appropriate taxa coordinator and with program coordinators for species that are part of conservation initiatives or other management programs. The regional SCP biologist is a good source of information on the regional status of non-game species. Additionally, FWC staff is authorized to handle federally listed species as long as actions are consistent with the requirements of the agency's Endangered Species Act Section 6 Cooperative Agreement. To meet these requirements, staff will provide reporting as outlined in the Agreement to the agency's Endangered Species Coordinator. Please note some contacts will also be covered under [Section 6.1.4: FWRI](#), and [Section 6.1.7: Florida's Wildlife Legacy Initiative](#).

Contacts:

Elsa Haubold, Species Conservation Planning Section Leader: (850) 488-3831
Robin Boughton, Avian Taxa Coordinator: (352) 732-1225
Melissa Tucker, Mammalian Taxa Coordinator: (386) 758-0525 ext 114
Bill Turner, Herpetofauna Taxa Coordinator: (850) 921-1143
Brad Gruver, Endangered Species Coordinator: (850) 488-3831
Deborah Burr, Gopher Tortoise Management Plan Coordinator: (850) 921-1019
Craig Faulhaber, Scrub-Jay Conservation Coordinator: (352) 732-1225
Michelle Vandeventer, Bald Eagle Management Plan Coordinator: (941) 894-6675
Zach Welch, Snail Kite Coordinator: (352) 266-6139

Nancy Douglass, Regional Biologist: (863) 648-3200
Amy Clifton, Assistant Regional Biologist: (863) 648-3200

6.1.2: Division of Hunting and Game Management (HGM)

As the FWC has a statewide quail strategy, coordination with HGM is recommended if issues regarding northern bobwhite quail arise on LWRWEA. Mourning dove banding activities are reported to HGM.

Contacts:

Paul Schulz, Section Leader: (850) 488-3831
Chuck McKelvy, FWC Small Game Program Coordinator: (850) 342-0256

6.1.3: Aquatic Habitat Restoration and Enhancement Subsection (AHREs)

A number of focal and imperiled species on LWRWEA depend on quality aquatic ecosystems to meet their life requirements (wading birds, limpkin). THCR should maintain contact with AHREs when conducting hydrologic evaluations to determine opportunities for hydrologic improvements on LWRWEA. LWRWEA staff should continue to coordinate with AHREs on management actions in the Peace Pond. The LIWG is based in this section.

Contact:

Steve Shea, Section Leader: (850) 488-3831
Bill Coleman, Biological Administrator: (352) 357-2398
Don Fox, Biological Administrator: (863) 462-5190
Beacham Furse, Biological Administrator: (863)462-5192
Steven Gornak, Biological Scientist: (863) 462-5190

6.1.4: Fish and Wildlife Research Institute (FWRI)

Area staff will cooperate with FWRI staff conducting monitoring and research for bald eagles by reporting new eagle nests through the FWC bald eagle database. Area staff will cooperate with Kevin Enge on herpetofauna monitoring and report documentation of these species to FWRI. Staff will communicate with Karl Miller on an assessment of the current location of kestrel nest boxes and whether sites that are more suitable can be identified. Jim Rodgers administers the FWC's migratory bird scientific collection permit. Report handling of migratory birds covered by the permit to Mr. Rodgers in January of each year. Staff will communicate with bear research staff regarding research results and implications for land management activities on LWRWEA.

Contacts:

Tim O'Meara, Section Leader: (850) 488-3831
Jeff Gore, Biological Administrator (mammals): (850) 265-3677
Ron Bielefeld, Wildlife Biologist (Florida mottled duck): (772) 228-9125
Janell Brush, Avian Research Biologist (bald eagle): (352) 955-2081
Karl Miller, Biological Administrator (avian): (352) 955-2081

Kevin Enge, Associate Research Scientist (herps): (352) 055-2081
Walter McCown, Biological Scientist (bears): (352) 955-2081
Brian Scheick, Biological Scientist (bears): (352) 955-2081
Jim Rodgers, Research Administrator: (352) 955-2081

6.1.5: Conservation Planning Services (CPS)

CPS works with private landowners and may be able to assist in making contacts or providing incentives for management activities on neighboring private lands. Maintaining communication regarding current and future projects will be critical.

Contacts:

Scott Sanders, CPS Section Leader: (850) 488-3831
Luis Gonzalez, Regional Coordinator: (863) 648-3200
Joe Sage, Wildlife Biologist: (863) 402-6545

6.1.6: Imperiled Species Management Section (ISM)

The Imperiled Species Management Section is responsible for the implementation and evaluation of imperiled species management and recovery plans. ISM coordinates wildlife crossings and would be involved in establishing crossing for black bears.

Contacts:

Kipp Frohlich, Section Leader: (850) 922-4330
Dave Telesco, Biological Administrator (bears): (850) 922-4330
Mike Orlando, Biological Scientist (bears): (386) 965-2464
Darrell Land, Biological Administrator (panthers): (239) 417-6352

6.1.7: Florida's Wildlife Legacy Initiative (FWLI)

Monitoring animal populations on a WMA/WEA gives managers a way to gauge response to management. If this information is not shared with others, valuable data that can be used to assess statewide conservation efforts often is lost. FWLI can assist in identifying potential partners and assisting with collaborating efforts for monitoring and management. FWLI also might be a source of funding via the State Wildlife Grants program. Therefore, regular communication with this section will be valuable.

Contacts:

Katherine Haley, Program Coordinator: (850) 410-0656 x17297
Kelly Rezac, Wildlife Legacy Biologist: (863) 648-3200

6.1.8: Invasive Plant Management Section (IPM)

The Invasive Plant Management Section provides technical and financial assistance to assist in the control of upland and aquatic invasive exotic plants. The Invasive Plant

Management Section may serve as a resource in identifying appropriate solutions to and funding for exotic plant issues.

Contact:

Bill Caton, Section Leader: (850) 617-9428

Donald Eggeman, Biological Administrator: (850) 410-0656

Danielle Schobl: (863) 534-7074

6.1.9: Ridge Rangers Volunteer Program

The Ridge Rangers volunteer program is the primary outreach and education program for the LWRWEA. The program operates regularly scheduled workdays, as well as a variety of independent activities, at LWRWEA and on other conservation lands in the region. Typical workdays include maintaining the endangered scrub lupine experimental plots at the Lake Blue tract, removing invasive plants from state property, and working with land managers to improve conditions on public conservation lands. The program is managed by the Ridge Ranger Volunteer Coordinator who reports to the LWRWEA area biologist.

Contact:

Bill Parken, Volunteer Coordinator: (863) 699-3937

6.2: Southwest Florida Water Management District (SWFWMD)

The SWFWMD manages the Jack Creek property in the Leisure Lakes area. Opportunities to coordinate management actions or initiate monitoring or research efforts for focal species should be discussed with SWFWMD staff. The SWFWMD also utilizes the Ridge Rangers for projects on Jack Creek.

Contact:

Stephanie Green, Sr. Land Management Specialist: (941) 377-3722

6.3: South Florida Water Management District (SFWMD)

The SFWMD manages the KICCO WMA, Hickory Hammock WMA, and Kissimmee River Public Use Area, all directly east of the Lake Wales Ridge. FWC coordinates with SFWMD regarding prescribed fire activities, as well as permitting for hydrologic activities as needed.

Contact:

Jeff McClemore, Land Steward: (800) 250-4200

6.4: Florida Department of Environmental Protection (DEP)

The DEP manages Lake June in Winter Scrub State Park and Highlands Hammock State Park, both near LWRWEA tracts. Opportunities to coordinate management actions or

initiate monitoring or research efforts for focal species should be discussed with DEP staff. The DEP also utilizes the Ridge Rangers for projects.

Contacts:

Highlands Hammock and Lake June in Winter State Parks:

Terry Hingtgen, District 4 Biologist: (941) 486-2051

Steven Dale, Park Manager: (863) 386-2051

Kissimmee Prairie Preserve State Park:

Jason DePue, District 3 Biologist: (407) 884-2000

Charles Brown, Park Manager: (863) 462-5360

6.5: Florida Forest Service (FFS)

The FFS provides authorizations for prescribed burning, assists in controlling escaped fires, and periodically conducts wildfire mitigation activities in megaparcels. FFS can provide assistance with timber management including administration of contracts for thinning operations. LWRWEA staff should continue to coordinate prescribed fire and timber management activities with FFS.

Contacts:

Tim Elder, Highlands County Forest Area Supervisor, Withlacoochee District: (863) 655-6407

Ricky Britt, East Polk County Forest Area Supervisor, Lakeland District: (863) 635-8592

Butch Mallett, Senior Forester: (850) 228-7809

6.6: Avian Research and Conservation Institute (ARCI)

ARCI surveys and keeps information on American swallow-tailed kite and short-tailed hawk populations. Location information on the swallow-tailed kite and short-tailed hawk, particularly nests or nesting behavior, should be shared with ARCI.

Contacts:

Dr. Ken Meyer, Avian Researcher: (352) 335-4151; meyer@arciinst.org

Gina Kent, Research Ecologist and Coordinator: (352) 514-5607;

ginakent@arciinst.org

6.7: Florida Bat Conservancy (FBC)

The FBC conducted surveys and assisted in identifying best locations for bat houses on LWRWEA. Continued coordination with FBC will be necessary if additional surveys are needed, or if additional bat houses need to be located on the area. Staff will periodically share bat house occupancy information and information on incidental encounters with bats with FBC.

Contact:

Cyndi Marks, Executive Director: (727) 710-2287

6.8: Florida Natural Areas Inventory (FNAI)

FNAI collects, interprets, and disseminates ecological information critical to the conservation of Florida's biological diversity. The FNAI's database and expertise facilitate environmentally sound planning and natural resource management to protect the plants, animals, and communities that represent Florida's natural heritage. The FNAI maintains a database of rare and listed species that is often used for planning purposes. As such, staff should share information about tracked species occurrences on LWRWEA with FNAI to ensure this information is included in their database. FWC also has a contract with FNAI for plant and animal surveys if the need exists and resources are available.

Contacts:

Dan Hipes, Chief Scientist: (850) 224-8207

6.9: United States Fish and Wildlife Service (USFWS)

The USFWS manages the LWRNWR, soon to be incorporated into the Everglades Headwaters National Wildlife Refuge (EHNWR). The USFWS manages property directly south of Carter Creek, and the nearby Flamingo Villas. The USFWS utilizes the Ridge Rangers periodically for trash clean-up and exotic plant removal activities. Opportunities to coordinate management actions or initiate monitoring/research efforts for focal species should be shared with USFWS staff.

Contacts:

Charlie Pelizza, Refuge Manager: (772) 562-3909

Keenan Adams, Deputy Refuge Manager: (772) 469-4305

Ryan Roche, Fire Technician: (772) 205-9958

6.10: Archbold Biological Station (ABS)

ABS is an independent research facility devoted to long-term ecological research, education and conservation. LWRWEA staff regularly communicates with ABS regarding research and land management. ABS Avian Ecology staff conduct Florida scrub-jay surveys on select LWRWEA tracts, University of Kentucky black bear researchers, in coordination with ABS, periodically conduct trapping activities on LWRWEA and ABS Plant Ecology staff conduct various levels of research and monitoring on plant populations. ABS staff provides LWRWEA staff with species and land management recommendations based on the results of research and monitoring activities. The GIS manager periodically assists with GIS projects on LWRWEA and provides GIS data as needed. ABS Land Management staff periodically assist with prescribed fire activities.

Contacts: (863) 465-2571

Hilary Swain, Executive Director

Reed Bowman, Program Director and Associate Research Biologist (Avian Ecology)
Wade Ulrey, Research Scientist, South-Central Fl Black Bear Project
Mark Deyrup, Program Director and Research Biologist (Entomology)
Eric Menges, Program Director and Research Biologist (Plant Ecology)
Carl Weekly, Research Assistant (Plant Ecology)
Sarah Haller, Research Assistant (Plant Ecology)
Stacy Smith, Research Assistant (Plant Ecology)
Mark Deyrup, Sr. Research Program Director and Research Biologist (Entomology)
Kevin Main, Land Manager
Roberta Pickert, GIS Manager

6.11: The Nature Conservancy (TNC)

TNC is a conservation partner on the Lake Wales Ridge. The Central Florida Ecosystem Restoration Team is frequently utilized during prescribed fire activities in scrub, and for chainsaw work when needed. A TNC biologist manages the Heartland Cooperative Invasive Species Management Area (CISMA).

Contacts: (863) 635-7506
Tricia Martin, Lake Wales Ridge Program Director
Steve Morrison, Conservation Program Manager
Cheryl Millett, Biologist, Heartland CISMA

6.12: Audubon of Florida

Audubon of Florida will manage the Jay Watch monitoring program in 2012, and plans to manage this program long-term. A coordinator has not been hired at the writing of this Strategy but LWRWEA staff will communicate with that person once the position is established.

Contact:
Julie Brashears Wraithmell, Director of Wildlife Conservation: (850) 224-7546

6.12.1: Highlands County Chapter of the Audubon Society

The Highlands County Chapter of the Audubon Society currently conducts avian monitoring on Lake Istokpoga. FWC staff periodically assists in wading bird breeding surveys.

Contact:
Paul Gray, Okeechobee Science Coordinator: (863) 655-1831

6.13: Lake Wales Ridge Ecosystem Working Group (LWREWG)

The LWREWG is a collaborative effort between federal, state and county agencies, water management districts, universities and other non-profit organizations. The mission of

the LWREWG is to ensure the long-term protection of the native plants, animals and natural communities of the Lake Wales Ridge. The LWREWG is managed by a steering committee that annually designates a chairperson to schedule and organize meetings and activities. LWRWEA staff maintains contact with the LWREWG through membership on the steering committee and sub-committees, and by periodically serving as chairperson.

Contact:

[LWREWG Website](#)

6.14: The Oriante Society

The Oriante Society is a non-profit reptile conservation organization that conducts research on eastern indigo snakes. The Oriante Society is conducting research on many conservation areas on the Lake Wales Ridge, including select LWRWEA tracts. FWC staff should communicate with Oriante researchers to ensure data sharing and coordination of research activities.

Contact:

Javan Bauder, Quantitative Ecologist: (206) 220-6638

6.15: Tall Timbers Research Station (TTRS)

FWC is adapting the Bachman's sparrow monitoring protocol developed in collaboration with TTRS. Staff will work with TTRS to initiate surveys on Royce Unit and Lake Placid Scrub.

Contact:

Jim Cox, Research Biologist: (850) 893-6470

6.16: Bok Tower Gardens

Bok Tower Gardens participates in the Center for Plant Conservation network and helps to conserve 64 rare central and north Florida plant species. Conservation Program staff at Bok Tower Gardens manage the scrub lupine reintroduction project at Lake Blue. FWC will continue to coordinate with Bok Tower Gardens staff for activities relating to this reintroduction project.

Contacts:

Cheryl Peterson, Conservation Program Manager: (863) 676-1408 x 2237

Juliet Rynear, Rare Plant Specialist: (863) 676-1408 x 2241

Section 7: Beyond the Boundaries Considerations

With appropriate management, there is enough potential habitat to support many of LWRWEA's focal species. LWRWEA can currently support a viable population of several species, such as the gopher tortoise, bluetail mole skink, sand skink, and Florida mouse.

While many of LWRWEA focal species are highly mobile (e.g. Florida black bear, Cooper's hawk, southern bald eagle, American swallow-tailed kite, southeastern American kestrel, short-tailed hawk and wading birds) and will likely continue to occur on the area, their long-term persistence is dependent on regional conditions. The surrounding network of conservation lands along the Lake Wales Ridge will help ensure the persistence of many of the wide-ranging focal species.

The current management boundaries identified for the area do not include all important habitat for focal species, such as the lands identified as Strategic Habitat Conservation Areas (SHCAs) for American swallow-tailed kite, Cooper's hawk, short-tailed hawk, and snail kite. The FWC originally identified SHCAs in the Closing the Gaps in Florida's Wildlife Habitat Conservation System report (Cox et al. 1994; available at [Closing the Gaps Report, 1994](#)). The goal of SHCAs is to identify the minimum amount of land needed in Florida to ensure long-term survival of key components to Florida's biological diversity. The SHCAs identify important remaining habitat conservation needs on private lands. New SHCAs have been identified in a recent FWC update to the Closing the Gaps entitled "Wildlife Habitat Conservation Needs in Florida: Updated Recommendations for Strategic Habitat Conservation Areas". The American swallow-tailed kite, Cooper's hawk, Florida black bear, Florida mouse, Florida panther, Florida scrub-jay, sand skink, burrowing owl, short-tailed hawk, and snail kite are species for which an SHCA was identified within 3 miles of LWRWEA tracts. Although it is unlikely Florida will acquire all property identified in SHCAs, property acquisition and encouraging land use and management that is compatible with the needs of LWRWEA focal species should be a priority.

The limitations on active management in the megaparcels severely restrict the ability of LWRWEA to fulfill its potential in the regional context for many focal species, such as the Florida scrub-jay, bluetail mole skink, and sand skink. A significant amount of acreage is contained within megaparcels, where land management opportunities are limited due to the juxtaposition of private lands and conservation lands and the restrictions this condition places on active management. However, even in their current conditions, the megaparcels provide significant habitat in support of scrub-jays, sand skinks, bluetail mole skinks, Florida mice, gopher tortoises, other imperiled wildlife, and rare plants. Megaparcels also provide green space for movement between conservation areas and private lands that support imperiled species. FWC should take every step possible to maximize the ability to manage habitat within the megaparcels, whether through acquisition or obtaining permission to apply land management to private lots.

It is estimated that 85% of the scrub on the Lake Wales Ridge has been lost to development or agriculture. Roadways further fragment available habitat, impede species' movement between areas of suitable habitat and increase mortality. Furthermore, significant human population growth is projected to occur in the area surrounding LWRWEA by the year 2060. While the current conditions on LWRWEA and neighboring conservation areas provides an opportunity to further the conservation of many focal and imperiled species, changes in management or land use beyond the boundaries could have a significant effect. Any changes that impede the ability to use prescribed fire would be detrimental to fire-dependent species such as Florida scrub-jay and gopher tortoise. Species that require large home ranges or are dependent on dispersal for maintaining a population are affected by adjacent land management or development. Any one of these factors could limit the ability of LWRWEA to fulfill its conservation role for focal wildlife species.

Many of LWRWEA's species are dependent on the availability of suitable habitat on adjacent private and public lands. The large private ranches on the southern end of the Lake Wales Ridge are considered important habitat for Florida black bears. Because LWRWEA is divided into 19 separate tracts surrounded by private and conservation lands, the actions of adjacent landowners will determine if some of these focal species will persist on LWRWEA. Staff should coordinate with CPS to ensure private landowners are informed about incentive programs that encourage conservation-based management, and that they receive the proper technical assistance to affect this management. CPS should ensure environmental commenting includes recommendations for compatible uses of lands adjacent to LWRWEA. Staff should also stay informed about state and county road expansions, and the opportunity to install wildlife crossings during project development.

In 2011, the USFWS proposed the establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area. The first acquisition for the project occurred in early 2012. This initiative is intended to improve water quality north of Lake Okeechobee, restore wetlands and increase connectivity among existing conservation lands and important wildlife corridors in the Kissimmee River Valley. Unlike a traditional refuge, the Everglades Headwaters NWR would consist of a mix of refuge lands and easements to fill gaps in the landscape. The LWRWEA falls within the Conservation Partnership Area but the bulk of new conservation land is well to the east along the Kissimmee River. Staff should stay informed of the progress of the new NWR and possible collaboration for focal species.

As many of LWRWEA's focal species also occur on neighboring public lands, staff should maintain continued involvement in the LWREWG. Collaboration with neighboring conservation managers for land and species management activities will further benefit focal species found on the Lake Wales Ridge. Conservation partnerships are critical to the long-term persistence of many species and should be encouraged.

Document Map

Species	Species Assessment	Land Management Actions	Species Management Actions	Species Monitoring	Research	Coordination
Gopher Frog	Section 3.2.1	Section 4.3.1		Section 5.2.1		Section 6.1.4
Bluetail Mole Skink	Section 3.2.2					
Eastern Indigo Snake	Section 3.2.3	Section 4.3.2		Section 5.2.5		Section 6.1.4, 6.14
Florida Pine Snake	Section 3.2.4	Section 4.3.2		Section 5.2.5		
Gopher Tortoise	Section 3.2.5	Section 4.3.3				
Sand Skink	Section 3.2.6					
American Swallow-tailed Kite	Section 3.2.7	Section 4.3.4	Section 5.1.1	Section 5.2.5		Section 6.6
Bachman's Sparrow	Section 3.2.8	Section 4.3.5		Section 5.2.2		
Brown-headed Nuthatch	Section 3.2.9	Section 4.3.6				
Cooper's Hawk	Section 3.2.10	Section 4.3.7		Section 5.2.5		
Florida Mottled Duck	Section 3.2.11			Section 5.2.5		Section 6.1.4
Florida Sandhill Crane	Section 3.2.12	Section 4.3.9		Section 5.2.5		
Florida Scrub-jay	Section 3.2.13	Section 4.3.10	Section 5.1.2	Section 5.2.3		Section 6.1.1, 6.10, 6.11, 6.12, 6.13
Limpkin	Section 3.2.14					Section 6.1.3
Northern Bobwhite	Section 3.2.15	Section 4.3.11				Section 6.6
Short-tailed Hawk	Section 3.2.16	Section 4.3.12		Section 5.2.5		Section 6.1.1, 6.1.3
Snail Kite	Section 3.2.17					Section 6.1.4
Southeastern American kestrel	Section 3.2.18	Section 4.3.13	Section 5.1.3	Section 5.2.4		Section 6.1.4
Southern Bald Eagle	Section 3.2.19	Section 4.3.14		Section 5.2.5		Section 6.1.1
Wading Birds	Section 3.2.20	Section 4.3.15		Section 5.2.5		Section 6.1.3, 6.12
Florida Black Bear	Section 3.2.21	Section 4.3.16		Section 5.2.5		Section 6.1.4, 6.1.6, 6.10
Florida Mouse	Section 3.2.22					
Sherman's Fox Squirrel	Section 3.2.23			Section 5.2.5		
Limited Opportunity Spp.	Section 3.2.24	Section 4.3.8		Section 5.2.5		

13.11 Prescribed Burning Plan

Lake Wales Ridge Wildlife and Environmental Area Prescribed Burn Plan

INTRODUCTION

Fire is the most essential element of habitat management in the State of Florida, and the Lake Wales Ridge is no exception. Lightning-born fires formerly maintained early succession-stage habitat zones across the present-day southeastern United States. Urban/ agricultural development and the need to protect human life and property have resulted in the suppression of lightning-born fires. However, land management staff use “prescribed” fire to maintain habitat for species that depend on early succession, fire-maintained ecosystems.

On the Lake Wales Ridge Wildlife and Environmental Area (hereafter LWRWEA), fire-maintained ecosystems comprise a majority of our total acreage. Sand pine/ oak/ and rosemary scrub, xeric/ mesic flatwoods, cutthroat grass seepage flatwoods (“wet prairie,” per FNAI), marshes, and sandhill habitat all require periodic burning to maintain proper habitat dynamics to support populations of imperiled plant and animal species. For instance, Florida Scrub-Jays vacate scrubs that are not maintained with fire; prior to leaving “over-grown” scrubs, nesting success is poor (Woolfenden 1984).

Indeed, a number of plant and animal species decline in the absence of fire applied at the appropriate intervals. Bachman’s Sparrows, Sherman’s Fox Squirrels, Pine Lilies, Cutthroat Grass, and approximately two-dozen plant species [endemic to Florida scrubs] also depend on fire to maintain their habitats. Additionally, fire is an integral component White-tailed Deer, Northern Bobwhite, and Wild Turkey management; hunting is an important service that the LWRWEA provides to local citizens.

Lastly, the LWRWEA is comprised of 19 scattered parcels of land between Venus and Auburndale; along the Lake Wales Ridge (the Lake Blue tract is located on the Winter Haven Ridge, near Auburndale/ Lakeland). Several LWRWEA tracts are located next to major highways, adjacent to housing developments, and in city centers (Mountain Lake Cutoff tract, in Lake Wales, and Lake Blue in Auburndale). Due to this “urban interface” situation, burning on the LWRWEA provides a challenge to staff, as specific weather parameters are required for burning certain parcels. Additionally, fire is essential not only for habitat management purposes, but also to reduce fuel loading and mitigate for risk of wildfire in/ near urban centers.

BURN OBJECTIVES

On the LWRWEA, prescribed fire has a twofold purpose 1) habitat management and 2) to mitigate for the effects of wildfire in urban interface situations. Fire will be used to manipulate habitat for native plant and animal species, with particular attention to imperiled and game species mentioned in the introduction. For “management units” receiving their first recorded prescribed (restoration) fire, objectives will be to burn as much vegetation as fire can reach

within the unit. For “maintenance” burns, lessened fire behavior and special attention to fire return interval will be used to achieve “patchiness” within a burn block. Patches of unburned fuels in burn units provide food and shelter for wildlife. Also, maintenance fires are generally scheduled on rotation, which allows for a gap of time between burning adjacent units. For restoration fires (such as at the Carter Creek megaparcel), fires in adjacent units are conducted in as short a timeframe as possible, to allow for safe burning in long-unburned, volatile fuel situations.

Lastly, for certain habitat types, special attention will be given to seasonality. For instance, fire applied from late September-early December can be detrimental to pine trees, particularly where high levels of decaying fuels (duff) are present. Additionally, certain plant species respond to fire applied from April-July with increased flower/ fruit production. Fire applied in the winter or even late summer, is of little ecological value as far as management of imperiled pine- grassland communities are concerned.

Benefits of burning on the LWRWEA include:

- 1) Enhanced wildlife habitat.
- 2) Increased capacity for flowering and fruiting of pinewoods/ sandhill/ marsh plant species.
- 3) Enhanced ability to detect exotic plant species.
- 4) Prepare sites for groundcover restoration.
- 5) Manage for game species such as deer, turkey, and quail.
- 6) Allow for easier staff and hunter access.
- 7) Mitigate for the effects of wildfire, especially in urban interface scenarios.

DESCRIPTION OF AREA

The LWRWEA is comprised of 19 tracts of land between Venus and Auburndale, mostly on the Lake Wales Ridge (Lake Blue is located on the Winter Haven Ridge). Total acreage of the area is 15,769 acres; the Tubbs tract is the smallest tract at approximately 60 acres, and the Leisure Lakes megaparcel is the largest tract, at approximately 8,587 acres. The main office is located east of the town of Lake Placid, on the approximately 2,600-acre Royce Unit.

Several tracts are located along US Highway 27- Gould Road, Henscratch 27, Messana, Sunray, and Mountain Lake Cutoff. Two other tracts are located along State Highway 70- Lake Placid Scrub and McJunkin. Two tracts are located within city limits, these being Mountain Lake Cutoff in Lake Wales, and Lake Blue in Auburndale. A number of tracts are located near housing developments. Specific weather parameters are required to mitigate for impacts of smoke on highways and neighborhoods, and tracts like Carter Creek, Tubbs, Henscratch 27, and Highlands Park Estates are of no exception.

Seven tracts (Carter Creek, Henscratch Subdivision, Orange Blossom, Leisure Lakes, Sun ‘n Lake, Holmes Avenue, Highlands Park Estates) were originally platted out for development. These parcels are a “checkerboard” of state and private ownership; LWRWEA staff must use cutting

equipment (i.e. gyrotrac) to “cut out” private parcels from a large aggregate of “lots” which form a burn unit.

Main habitat types include sand pine scrub, oak scrub, rosemary scrub (rosemary bald), scrubby flatwoods, xeric/ mesic flatwoods, sandhill, lakes and streams with their associated wetlands, depression marshes, cutthroat grass seepage flatwoods (wet prairie), ruderal sites such as pasture, and mesic and hydric hammocks.

PRESCRIBED BURNING PROGRAM

- **FIRELINES, MANAGEMENT UNIT ACREAGE**

LWRWEA staff use firebreaks, walking paths, and natural features (i.e. bayheads, streams, and lakes) to delineate burn unit boundaries. 175 burn units have been established on the LWRWEA, ranging in size from 12 acres at Carter Creek, to over 300 acres at Lake Placid Scrub. Total burn unit area is 10,384 acres. Mineral soil firebreaks are maintained by tractor and disk; “wet-lining” is used in small amounts where disking was ineffective at breaking up grassy stretches of trail into mineral soil. There are approximately 1,147,558.8 feet of firebreaks on the LWRWEA.

- **TYPE OF BURN**

Most habitat types on the LWRWEA are adequately managed using the standard technique of backing and flanking fires to begin a burn, and flanking fire and some head fire to finish the burn. These types of burning strategies will be used in areas where flatwoods fuels are present, to minimize negative effects to the pine overstory. Additionally, backing and flanking fires generally consume fuels better than head fires. However, backing fires are generally ineffective when burning scrubs. Here, strips of fire are used near the downwind firebreaks to widen the firebreak. This accounts for the majority of time spent on “scrub fires.” Lastly, head fire is applied in large quantities to consume the oak trees and kill sand pines that comprise typical Florida scrubs. Scrub fire is high-intensity and “catastrophic,” compared to low-intensity burning that takes place in sandhills, flatwoods, marshes, prairies, and pastures.

- **SEASONALITY AND TIMING**

Ideally, burning of flatwoods, prairie, sandhill, and marsh habitat would take place between 01 April and 31 July, and cease during the rest of the year. However, due to a “backlog” of unburned acres on the LWRWEA, burning in these habitat types takes place all year long. Generally, flatwoods fire between September and January can be harmful to pine trees; burning in these habitats during late summer-fall-winter usually coincides with large rain events and low drought indices. LWRWEA staff makes few considerations for seasonality as it pertains to scrub fire; the major consideration is NOT to burn scrubs where Florida Scrub-Jays are nesting (generally March-May).

Per Florida Forest Service regulation, most burning is permitted between 0900 and sunset. Most burns on the LWRWEA are started 0900-1100, and finished before sunset. LWRWEA burn

managers put emphasis on securing “black lines” (using backing/ flanking fire to secure the downwind line of a unit) prior to using head fire (especially in scrub) by 1300-1400. Relative humidity (RH) is lowest at these times of the day, and low RH tends to equate to dangerous fire behavior and control problems.

WEATHER CONDITIONS AND SMOKE MANAGEMENT

Smoke management is a paramount consideration when planning fire on the LWRWEA. As mentioned, a number of our parcels border roads and/ or housing developments, or are in towns. Additionally, LVORI and fog forecasts are checked to prevent fog on roadways and developments.

Wind direction for a particular unit is always based on a number of factors: 1) minimal impact to human habitation 2) minimal impact to roadways 3) minimal impact to smoke-sensitive areas such as schools and houses 4) minimal impact to power lines bordering burn units (especially Carter Creek and Silver Lake).

Minimal mixing height is generally 15,000- 20,000 feet, and minimum dispersion is generally 30. RH ranges from 30-70%, depending on habitat type (lower RH's generally favor burning in scrub, while higher RH's generally allow lessened fire intensity in flatwoods situations).

Also, LWRWEA burn managers pay attention not only to weather conditions day-of, but also the following night and the next couple of days, depending on A) proximity to development and B) proximity to roadways. Indeed, multiple days with a consistent, steady wind speed and direction are useful in preventing smoke-related problems in the time following burns.

PERSONNEL

The LWRWEA staff is comprised of 6 personnel who burn, plus 1 Biological Administrator who helps on fires as needed. Additionally, 3 Biological-scientist III's are based in close proximity to the LWRWEA and periodically assist on burns. Most prescribed fires feature 4-8 personnel plus one Certified Burn Manager. Additionally, Florida Forest Service (FFS) personnel are invited to assist, depending on availability of personnel and fuel types.

EQUIPMENT

All members of the fire crew will wear, at a minimum, the PPE required by FWC's Prescribe Burning and Wildfire Suppression Standards. Type V or VI engines, tractor-plows, farm tractors, 4-4 vehicles, and other equipment may be used as conditions require. Smoke caution signs for nearby roads will be deployed as necessary.

Additionally, hand-held radios, flappers, council rakes, shovels, drip torches, burn mix, and draft pumps/ hoses are necessary. Occasionally, FFS staff brings a tractor-plow to be on stand-by, in case of emergency.

PERMITS AND NOTIFICATIONS

An authorization will be obtained from FFS on the morning of the burn. Additionally, other notifications are made as needed;

- An email is sent to a suite of contacts in the regional office in Lakeland
- Notification is given (depending on size of burn, and proximity to human habitation/ roadways) to Highlands County dispatch
- Notification is given to Highlands County Road and Bridge department if burning near major roadways, such as HWY 70 or HWY 27

- Notification is given to neighborhood associations when burning near certain developments (i.e. Carter Creek)
- "Dear Neighbor" letters are written to homeowners in close proximity to a burn, especially when putting smoke in their direction is unavoidable (i.e. smoke will impact the fewest number of homes)

EVALUATION OF BURN

Burns will be evaluated the following day to check for any residual smoke and flame. Mop-up will be conducted as necessary. Additionally, the unit will be visited multiple days following the burn ESPECIALLY when unburned fuels present potential post-burn control issues.

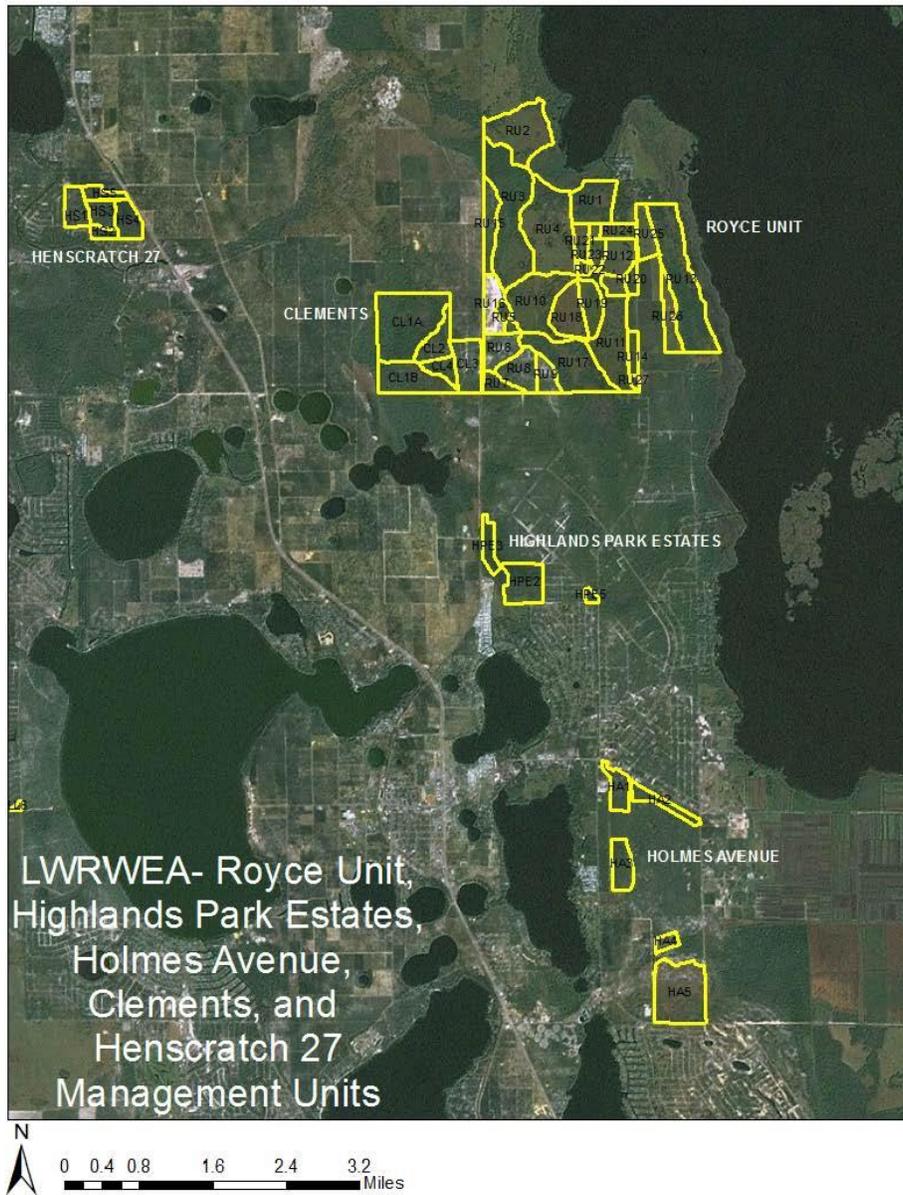
LITERATURE CITED

Woolfenden, Glen E. and John W. Fitzpatrick. 1984. The Florida Scrub-Jay: Demography of a cooperatively breeding bird. Princeton University Press, Princeton, NJ.

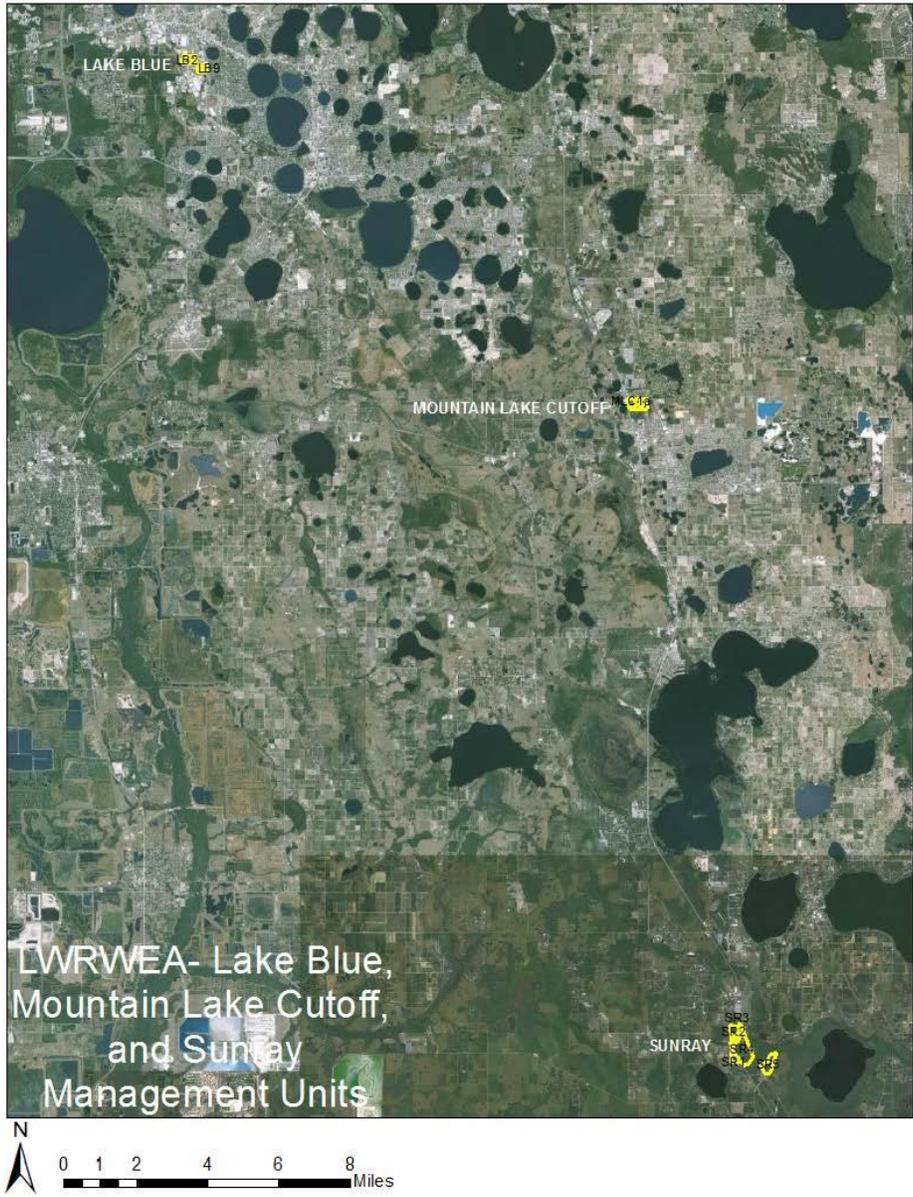
HABITAT BREAKDOWN

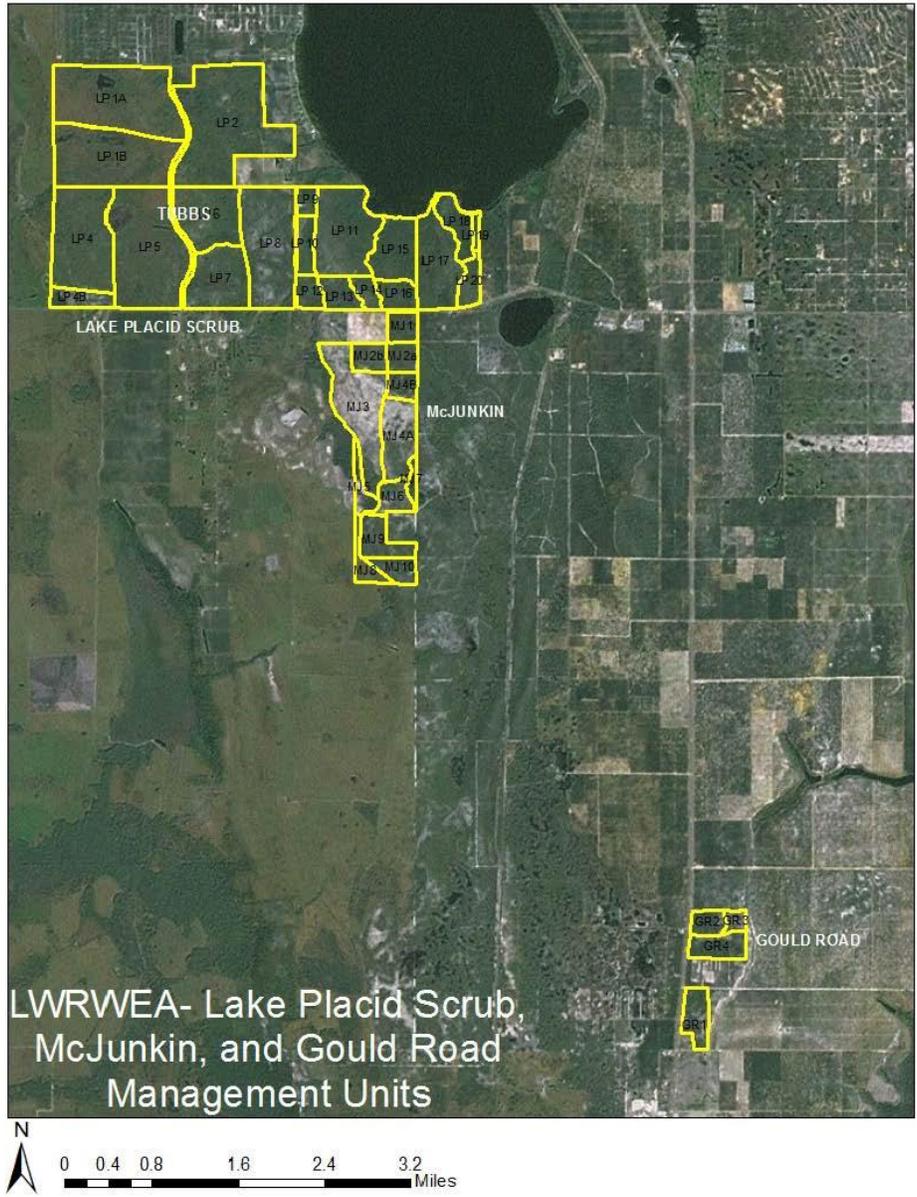
Per FNAI, burnable habitat acres on the LWRWEA:

- Agriculture- 292 acres
- Basin Marsh- 210 acres
- Depression Marsh- 739 acres
- Mesic Flatwoods- 2,561 acres
- Ruderal and Restoration sites- 1,033 acres
- Sandhill- 595 acres
- Scrub and Scrubby Flatwoods- 6,247 acres
- Wet Flatwoods and Wet Prairie- 1,453 acres
- Xeric Hammock- 55 acres

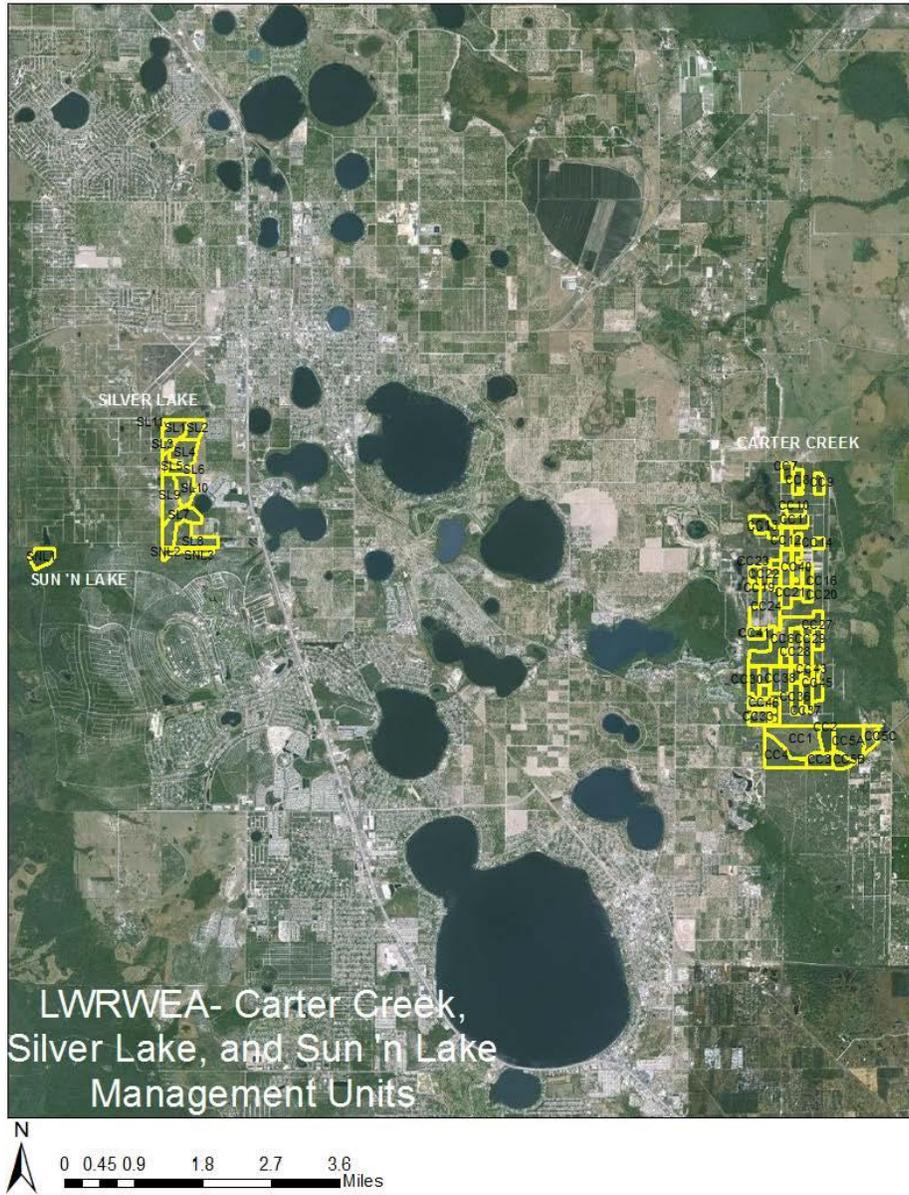


LWRWEA- Royce Unit,
Highlands Park Estates,
Holmes Avenue,
Clements, and
Henscratch 27
Management Units

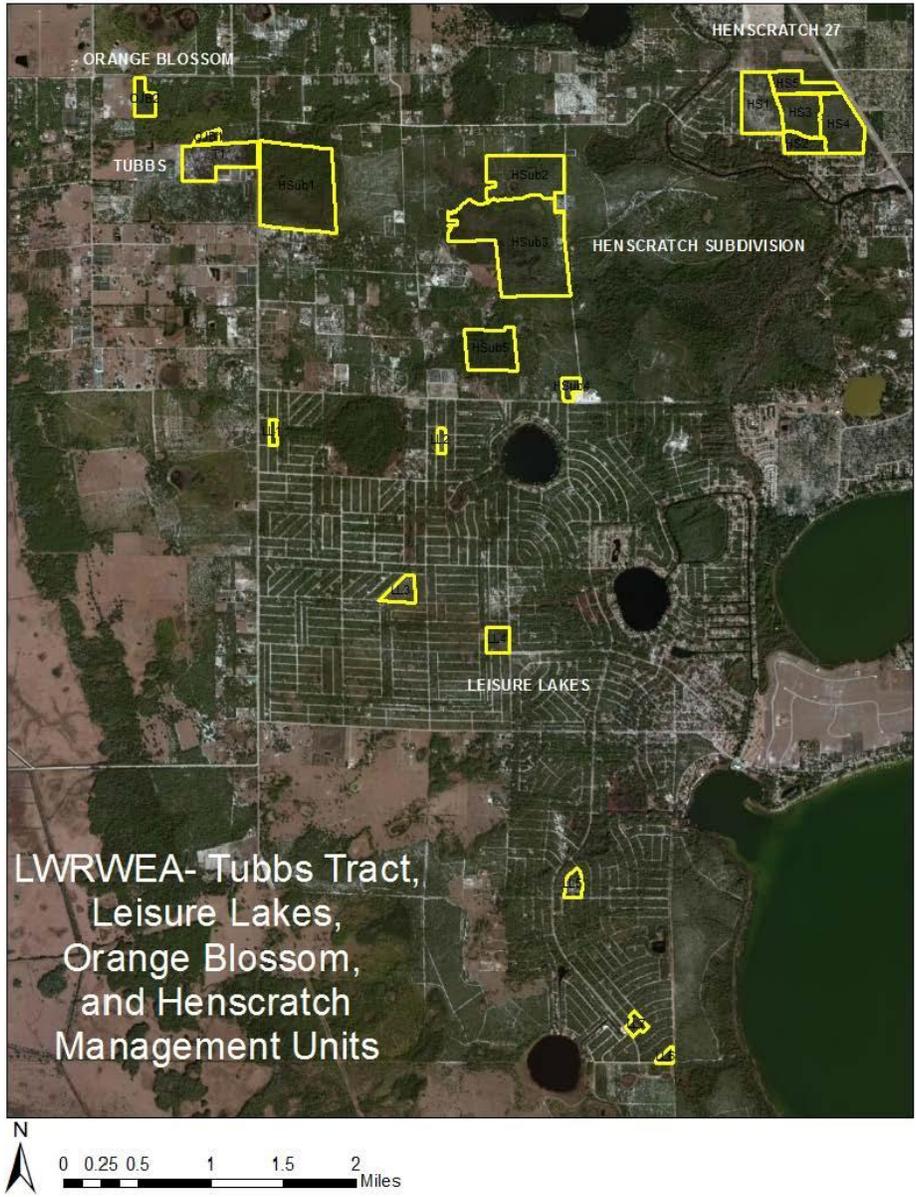




LWRWEA- Lake Placid Scrub, McJunkin, and Gould Road Management Units



LWRWEA- Carter Creek,
Silver Lake, and Sun 'n Lake
Management Units



DIVISION OF HABITAT AND SPECIES CONSERVATION
Internal Operating Policy
Revised March 2011

Subject: Prescribed Burning and Wildfire Suppression Standards

Policy:

The following policy shall apply to all Division of Habitat and Species Conservation (DHSC) employees engaged in prescribed burning or wildfire suppression activities.

General Guidelines:

This policy establishes minimum standards for participation in prescribed burning and wildfire suppression activities. In addition to conducting prescribed burning on Commission-managed lands, DHSC employees are periodically asked to assist the Florida Division of Forestry with wildland fire suppression efforts, particularly during declared wildfire emergencies. Working on prescribed fires or wildfires is an inherently dangerous and risky activity that can result in significant property damage, personal injury, or loss of life. Therefore, it is necessary to establish minimum standards for training and certification to insure DHSC employees have the appropriate skills and knowledge to perform these activities safely and effectively. Employees are encouraged to obtain higher levels of training and certification as warranted and approved through supervisory channels.

Chapter 1 Prescribed Burning

1.1 Prescribed Burn Participation: This section establishes minimum training, certification, and experience required for members of a prescribed burn team. These same standards apply to non-DHSC employees, volunteers, and contractors participating on a burn on FWC-managed state lands.

- A. **Crew Member Trainee:** Employees who do not meet the requirements for Crew Member shall be classified as a Crew Member Trainee. A Crew Member Trainee may participate in prescribed burning activities provided that they are under the direct supervision of a Crew Member. A Crew Member may supervise no more than one Crew Member Trainee. It is recommended that no more than 40% of the burn crew be Crew Member Trainees.

Note: Crew members may supervise more than one Crew Member Trainee, and more than 40% of the burn crew may be Crew Member Trainees during prescribed burns conducted during training classes.

- B. **Crew Member:** May participate independently in prescribed burning activities. Shall have successfully completed the following level of training:

- 1) Interagency Basic Prescribed Fire Course; *or*
 - 2) Basic Wildland Firefighter Training (S-130) **and** Introduction to Wildland Fire Behavior (S-190).
- C. **Burn Manager Trainee:** May serve as burn manager to fulfill the responsibilities of acquiring certified prescribed burn manager status. Burn Manager Trainee must be under the direct supervision of a Certified Burn Manager on prescribed burns that will be used to qualify them for certified prescribed burn manager status. Shall have successfully completed the following level of training and have the specified level of experience:
- 1) Interagency Basic Prescribed Fire Course;
 - 2) S-130/S-190; *and*
 - 3) Participated on at least five prescribed burns.
- D. **Certified Burn Manager:** May request prescribed burn authorizations and serve as burn manager. Shall have successfully completed the following level of training, and have the specified certification and level of experience:
- 1) Interagency Basic Prescribed Fire Course;
 - 2) S-130/S-190;
 - 3) Prescribed Burn Manager Certification; *and*
 - 4) Participated on at least ten prescribed burns.
- 1.2 Prescribed Burn Engine (Pumper Unit/Brush Truck) Operator:** Before an employee may independently operate a water-delivery engine in support of active prescribed burns, they shall have successfully completed the following level of training and have the specified level of experience:
- A. S-130/S-190;
 - B. On-the-job training for operation of water-delivery engines by a trained and/or experienced engine operator; *or* successful completion of Southern Area Engine Academy or Engine Operator (PMS 419); *and*
 - C. Participated on at least five prescribed burns.
- 1.3 Prescribed Burn Tractor/Bulldozer Plow Unit Operator:** Before an employee may independently operate tractor/dozer fire-plow during prescribed burns, they shall have successfully completed the following level of training and have the specified level of experience:
- A. The wildland fire portion of Basic Fire Control Training; *and*
 - B. Participated on at least five prescribed burns.

1.4 Prescribed Burn Aerial Ignition Dispenser (AID) Operator: Before an employee may independently operate an AID during a prescribed burn, they shall have successfully completed the following level of training and have the specified level of experience:

- A. Qualified at or above Crew Member level for prescribed burning;
- B. Completed an FWC AID training workshop or other courses that provide an equivalent level of training; *and*
- C. Participated on at least five prescribed burns.

1.5 General: All prescribed burns shall be conducted in complete compliance with all laws regulating the use of prescribed fire; specifically Chapter 590.125(3) F.S. and Chapter 51-2 F.A.C. Burn plans shall have all the required elements as specified in Chapter 51-2.006 as well as a contingency plan, mop-up standards, and standards for declaring the fire out. All prescribed burns shall be conducted as a certified prescribed burn, and managed by a certified prescribed burn manager.

Chapter 2 Wildfire Suppression

2.1 General: The Division of Forestry, or other firefighting entity, may request assistance from DHSC staff during a wildfire suppression incident. This request will usually be for a wildfire strike team. A wildfire strike team consists of one wildfire strike team leader, and two wildfire strike team members per Type V or VI engine. Standards for strike team members and leaders are outlined below. In addition, requests may be made for personnel to fill positions on a suppression incident that are not covered by the following standards. The decision to assist, and the level of assistance provided, on fire suppression incidents will be made by DHSC leadership (includes Division Director, Deputy Division Director, Section Leaders and/or Assistant Section Leaders) and the Wildland Fire Coordinator.

2.2 Wildfire Strike Team Member: Before an employee may participate on wildfire strike teams in support of wildfire suppression efforts, they shall have successfully completed the following level of training and have the specified level of experience:

- A. S-130/S-190;
- B. Southern Area Engine Academy;
- C. Experience and demonstrated proficiency operating a Type V or VI engine; *and*
- D. Participated on at least ten prescribed burns and/or wildfire suppression incidents.

* Exception - Employees who do not meet the above standards can be approved by DHSC leadership and the Wildland Fire Coordinator to serve on a wildfire strike team. Exceptions can be granted when available strike team personnel are not sufficient to meet the requested need. Training and experience levels should be considered when approving exceptions.

2.3 Wildfire Strike Team Leader: Before an employee may serve as team leader for wildfire strike teams in support of wildfire suppression efforts, they shall have completed the following

level of training and have the specified level of experience in addition to that required to participate on a wildfire strike team:

- A. Basic Incident Command System (I-200); **and**
- B. Experience as burn manager, crew boss, or strike team leader on at least ten prescribed burns or wildfire suppression incidents.

2.4 Wildfire Tractor/Bulldozer Plow Unit Operator: Before an employee may independently operate tractor/dozer fire-plow units in support of wildfire suppression efforts, they shall have completed the following level of training and have the specified level of experience:

- A. The wildland fire portion of Basic Fire Control Training;
- B. Experience and demonstrated proficiency operating a tractor/bulldozer plow unit; **and**
- C. Participated on at least ten prescribed burns or wildfire suppression incidents.

Chapter 3 Safety

3.1 Personal Protective Equipment: Required items of Personal Protective Equipment for all wildland fire activities include:

- Flame Resistant Shirt and Pants, or Jumpsuit
- Wildland Fire Hard Hat
- Leather Gloves
- Leather Boots – 8” Lace-up
- Eye Protection
- Bandana or Dust Mask
- Hand-held Radio
- Fire Shelter

Safety considerations and/or vegetative types may dictate that crew members wear additional equipment or in some cases deviate from the above required equipment. The burn manager/strike team leader shall determine what Personal Protective Equipment will be worn by their crew to maximize safety, and shall document justifications for any deviations of the required equipment.

3.2 Physical Standards: Prescribed burning and firefighting are physically demanding activities. Each prescribed burn crew/strike team member shall maintain a level of fitness that will allow full participation in these activities. It is the burn crew/strike team member's responsibility to make the burn manager/strike team leader aware of any limitations that may restrict their activities so that they can be assigned an appropriate role.

3.3 Mobile Equipment: The following is a list of required items for mobile equipment used during wildland fire activities. Mobile equipment includes all-terrain vehicles, utility vehicles, airboats, swamp buggies, trucks, tractors, and bulldozers.

- An ABC fire extinguisher that has been inspected, serviced, and maintained in accordance with the manufacturer's maintenance procedures shall be in or on all mobile equipment. Below are minimum sizes:
 - All-terrain and utility vehicles – 2.5 pound extinguisher
 - Trucks and tractors – 5 pound extinguisher
 - Bulldozers and Swamp Buggies– 10 pound extinguisher
 - Vessels – 5 pounds (could be two, 2.5 pound extinguishers)
- An operational winch shall be installed on all-terrain vehicles, utility vehicles, swamp buggies, and trucks used in the interior of a burn unit.
- An operational water delivery system with at least five gallons of water shall be installed in or on any mobile equipment used in the interior of a burn unit.

Chapter 4 Incident Reviews

4.1 Incident Reviews: This section outlines a mechanism for how DHSC will respond to and review a prescribed fire that had unintended negative consequences. The purpose of a fire-related incident review is to gather facts regarding the incident, and if necessary, recommend actions that may help minimize the chance of reoccurrence.

4.2 Fire-related Incident: A fire or smoke related incident that includes any of the following:

- A. Notice of Violation;
- B. Conducting a burn outside of the prescription;
- C. Fire leaves the prescribed burn area;
- D. Fire leaves the WMA or WEA; or
- E. Fire causes property damage, personal injury, or loss of life.

4.3 Reporting of Fire-related Incidents: The burn manager shall notify their Regional Wildlife Management Biologist as soon as possible but no later than 8:00 am the day after the fire-related incident occurred. The Regional Wildlife Management Biologist shall notify THCR leadership and the Wildland Fire Coordinator of the incident as soon as possible. The notification should include the following:

- A. Date, Time and Location of Incident
- B. Brief Description of the Incident and Current Status
- C. Other Agencies or Entities Assisting

THCR leadership will notify Division leadership and the Executive and Assistant Executive Director of any incidents involving escapes from the WMA, escapes requiring unplanned

suppression assistance, or any incidents resulting in private property damage or injury to a member of the public.

4.4 Fire-related Incident Review: A review of a fire-related incident initiated by the Wildland Fire Coordinator resulting in a written finding of facts and recommendations. The following guidelines should be used to determine the type of review conducted:

- A. **No Review** – No review is required if the prescribed fire escaped from the burn unit, stayed on the WMA/WEA, and was suppressed. These incidents, however, need to be reported to the Regional Wildlife Management Biologist and the Wildland Fire Coordinator if Division of Forestry or other entity assisted with suppression efforts.
- B. **Level 1 Review** – Review to be conducted by the Wildland Fire Coordinator or alternate if one or more of the following occurred and no Level 2 review criteria were met:
 - 1) A Notice of Violation was issued to the burn manager.
 - 2) Motorized equipment was damaged requiring the completion of an Equipment Damage Report.
 - 3) A Level 1 review is requested by DHSC leadership.
- C. **Level 2 Review** – Review to be conducted by the Wildland Fire Coordinator or alternate, and one representative from at least three of the administrative regions if one or more of the following occur:
 - 1) Prescribed fire escaped from the burn unit and from the WMA/WEA.
 - 2) Injury or private property damage resulted from the fire or smoke. If an injury occurs to a member of the burn crew, the need to convene a review team will be determined by DHSC leadership.
 - 3) A Level 2 review is requested by DHSC leadership.

4.5 Fire-related Incident Report: Within 45 days of completing a Fire-related Incident Review, the Wildland Fire Coordinator shall submit a report to DHSC leadership for approval. The report should include: 1) a summary of the incident; 2) a review of the weather forecast and observed weather conditions; 3) a review of the burn prescription; 4) a summary of the execution of the burn and the suppression of the escape, if applicable; and 5) recommendations for future burns. After being approved, the report will be made available to appropriate personnel via e-mail and by being posted on the Terrestrial Habitat and Conservation's Wildland Fire Sharepoint site.

Approved: Timothy A. Meault 3-2-2011
Division Director or Designee Date
Division of Habitat & Species Conservation
Florida Fish and Wildlife Conservation Commission

13.12 Polk and Highlands counties Letter of Compliance with Local Government Comprehensive Plan

330 West Church Street
PO Box 9005 • Drawer GM01
Bartow, Florida 33831-9005



PHONE: 863-534-6467
FAX: 863-534-6543
www.polk-county.net

OFFICE OF PLANNING AND DEVELOPMENT

February 17, 2015

Rebecca Shelton
Florida Fish and Wildlife Conservation Commission
620 S. Meridian Street
Tallahassee, FL 32399

RE: Florida Lake Wales Ridge Wildlife and Environmental Management Area Plan (Plan)
Comprehensivity

Dear Ms. Shelton:

Thank you for the opportunity to review the subject Plan. The Plan is consistent with the Polk County Comprehensive Plan including the overall Comprehensive Plan goal and the goals of the Conservation Element, Recreation Element, and our PolkGreen policies.

Future Land Use Element

GOAL: To achieve an economically viable, efficient, safe, and quality-living environment through balanced and compact growth, while encouraging the efficient use of land, community infrastructure and protecting and managing the community's natural resources by showing the proposed distribution, location, and extent of future land uses by type, density, and intensity; while providing essential services in a cost effective manner.

It is important to note that the proposed uses (as identified in Section 3.3.1) will need to be reviewed on a case by case basis depending upon their proposed location and current land use (zoning) designation. We appreciate the opportunity to be involved in the conservation and preservation of a valuable natural resource within Polk County. If you have any questions or comments regarding this review or any future involvement by the planning staff, please feel free to contact me or Chanda Bennett at 534-6792.

Sincerely,

Tom Deardorff, AICP, Director
Office of Planning and Development

COMMISSIONERS: George Lindsey III, Chairman • Melony M. Bell • Edwin V. Smith • R. Todd Dantzler • John Hall, Vice Chairman



HIGHLANDS COUNTY

BOARD OF COUNTY COMMISSIONERS

PLANNING DEPARTMENT

February 17, 2015

Ms. Rebecca Shelton
Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation, Land Conservation and Planning
620 S. Meridian Street
Tallahassee, FL 32399

RE: Consistency with the Highlands County Comprehensive Plan

Dear Ms. Shelton:

It is our understanding that the Florida Fish and Wildlife Conservation Commission is completing an update to the Lake Wales Ridge Wildlife and Environmental Management Area (LWRWEA) Management Plan, and that the update requires a letter from the local county government that addresses whether or not the update is in compliance with the *2030 Highlands County Comprehensive Plan*.

Please be advised that the update to the LWRWEA Management Plan complies with the Future Land Use Element and the Natural Resources Element within the *2030 Highlands County Comprehensive Plan*.

Do not hesitate to contact us if you require any additional information.

Sincerely,

Susan BuChans, AICP
Planning Supervisor

cc: June Fisher, County Administrator
Randal Vosburg, Assistant County Administrator
Mark J. Hill, Development Services Director

13.13 Operation Plan Fiscal Year 2013-2014

Land Management Uniform Accounting Council Categories and Subcategories

1. Resource Management

- a. Exotic Species Control. -- Invasive exotic plant and animal removal activities and costs for inventorying, planning, preparing, executing, evaluating, monitoring and reporting. Also includes equipment, chemicals, protective clothing and supplies. Includes nuisance native feral animal and plant control.
- b. Prescribed Burning. -- Prescribed burning activities and costs for assessing, planning, preparing, executing, evaluating and reporting. Also includes equipment, protective clothing and supplies.
- c. Cultural Resource Management. -- Management activities and costs for assessing, planning, executing, evaluating and reporting, and for all maintenance, restoration or monitoring activities for prehistoric and historic sites, features and collection objects.
- d. Timber Management. -- Activities and costs related to the establishment of a stand of potentially merchantable timber, harvest of merchantable timber, and cultural treatments intended primarily to improve the growth and overall health of a stand of merchantable timber. Also includes activities and costs related to the cutting of merchantable timber in natural community and habitat restoration projects.
- e. Hydrological Management. -- Hydrological management and restoration activities and costs for assessing, monitoring, planning, preparing, executing, evaluating and reporting. Includes water level management, repair, removal or back-filling of ditches, canals, berms and dams. Also includes water quality and water quantity monitoring.
- f. Other. -- All other resource management activities and costs not captured in other specific subcategories. Examples include natural community and habitat restoration through other techniques; plant, animal or biological community survey, monitoring and research; listed species management; technical assistance; and evaluating and commenting on resource impacts to parks.

2. Administration

- a. Central Office/Headquarters. -- Headquarters units conducting general administration of land under management by the agency. Includes upper management direction, administration and fiscal, budget, personnel, purchasing and record keeping required for operations oversight and specific programs. Includes all duties unless they specifically relate to other categories or subcategories.
- b. Districts/Regions. -- Sub-state administrative districts or regions conducting general administration of the properties under their management. Includes all duties, unless they specifically relate to other categories or subcategories.

General operating costs of district or region administrative facilities are included.

- c. Units/Projects. -- Conducting general administration duties at a specific management unit (state park, state forest, state wildlife management area, etc.). Includes supervisory duties, fiscal and record keeping duties, and any other duties that do not specifically relate to other categories or subcategories. General operating costs for the property, such as utilities, telephones and garbage collection, are included.

3. Support

- a. Land Management Planning. -- Developing land management plans required by Sec. 253.034, F.S. Includes researching and compiling plan information, materials and maps, coordinating planning activities, conducting review activities (internal reviews, public meetings, advisory group meetings, ARC, etc.), and promulgating draft plans and final plans.
- b. Land Management Reviews. -- Planning, organizing and conducting land management reviews by teams created under Sec. 259.036, F.S. Includes preparing and responding to land management review reports. Also includes similar work conducted as part of internal agency land management reviews.
- c. Training/Staff Development. -- Staff training and development costs incurred in any facet of the agency's land management activities.
- d. Vehicle Purchase. -- Acquisition of any vehicle purchased primarily for land management purposes or to support any category of land management activity by the agency.
- e. Vehicle Operation and Maintenance. -- Costs of operating and upkeep of any vehicle used by the agency to support any category of land management activity.
- f. Other. -- Any other support activity or cost not captured by other categories or subcategories.

4. Capital Improvements

- a. New Facility Construction. -- Use of Fixed Capital Outlay (FCO) or other budget authority for all new facility design and construction activities. Includes new roads, parking and all other infrastructure.
- b. Facility Maintenance. -- Use of Fixed Capital Outlay (FCO) or other budget authority for all repairs or renovations to existing facilities, roads or other infrastructure. Also includes ADA accessibility improvements and renovations.

5. Visitor Services/Recreation

- a. Information/Education Programs. -- Interpretive, environmental education and marketing programs that explain or promote the agency's mission or instill in visitors an understanding and appreciation for Florida's natural and cultural resources and their proper use and care. Includes signs, brochures, maps and other public information materials that are produced or disseminated.
- b. Operations. -- Includes the non-administrative and non-support costs involved in providing public access to lands. Includes all actions required to manage visitor activities in a way to ensure safe and enjoyable use by the public. Includes routine maintenance, cleaning and other work required to provide safe and efficient utilization of facilities and resources that support visitor use and recreation. Includes protection activities required by staff to safeguard natural and cultural resources, facilities, material, staff and visitors.

6. Law Enforcement

The provision of all activities for enforcing criminal, conservation and boating laws on land, freshwater and marine environments and all costs associated with these services. Includes the provision of uniform patrol. Includes overt and covert criminal investigations. Includes regulation of commercial wildlife trade. Also includes the direction and administration of all law enforcement programs and activities, and all associated costs.

Land Management Uniform Accounting Council Categories and FWC Activity Codes

Resource Management

Exotic Species Control

- 210 Exotic species control
- 211 Exotic plant control (mechanical)
- 212 Exotic plant control (chemical)

Prescribed Burning

- 205 Prescribed burning
- 206 Prescribed burning C growing season (April 1 to September 30)
- 207 Prescribed burning C dormant season (October 1 to March 31)
- 208 Firebreaks

Cultural Resource Management

- 201 Cultural resource management

Timber Management

- 202 Timber management

Hydrological Management

- 215 Hydrology management
- 216 Dams, dikes, levees
- 217 Canals
- 218 Water level management
- 194 Lake restoration

Other

- 185 GIS
- 186 Biometrics
- 200 RESOURCE MANAGEMENT

203	Tree and shrub planting
213	Wildlife management
214	Listed Species management
219	Upland restoration
282	Herbaceous seeding
283	Clearings
289	Native vegetation management (mechanical)
290	Native vegetation management (chemical)
221	Animal surveys
228	Inland aerial surveys
235	Vegetation and plant surveys
250	MONITORING AND ASSESSMENTS
252	Biomedical monitoring
253	Ecological monitoring
256	Habitat monitoring analysis
263	Nest box monitoring
264	Population demographics
295	Biological data collection, analysis, and reporting
275	Permits and authorizations
276	Commission rule development and review
277	Relocation
278	CITES tags
281	Other resource management
284	Feeding/watering
285	Nest structures
286	Population control
287	Stocking enhancements/population augmentation
288	Nuisance animal complaints
293	Mortality investigations
294	Program coordination and implementation C inter- and intra-agency coordination and program implementation at the section, bureau, or division level
296	Habitat protection technical assistance
750	URTD assessment
789	Site Preparation – GCR
790	Irrigation – GCR
791	Seed Collection – Hand
792	Seed Collection – Mechanical
793	Herbicide Maintenance Treatment

Administration

Central Office/Headquarters

100	ADMINISTRATION C administrative tasks, including preparation of forms, word processing, photocopying, filing, and other clerical/secretarial duties.
104	Budget/purchasing/accounting

Support

Land Management Planning

103	Meetings C includes workshops, conferences, staff, and other meetings.
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204	Resource planning
<u>Land Management Reviews</u>	
209	Land Management Reviews
101	Project inspection C field inspections of projects.
<u>Training/Staff Development</u>	
150	PERSONNEL MANAGEMENT C recruitment, hiring, training, counseling, and supervising.
<u>Vehicle Purchase</u>	
128	New Vehicle and Equipment Purchase
<u>Vehicle Operation and Maintenance</u>	
923	FEM C vehicles/equipment
<u>Other</u>	
140	REPORT WRITING/EDITING/MANUSCRIPT PREPARATION
141	Grant applications
180	SYSTEMS ADMINISTRATION AND MANAGEMENT
182	Data management
184	Metadata development and management
187	IT
188	Web development
721	Geospatial analysis techniques
191	Stamp design coordination
226	Human dimensions surveys
Capitol Improvements	
<u>New Facility Construction</u>	
910	New facility construction C buildings/structures
912	New construction C roads/bridges
913	New construction C trails
914	New construction C fences
<u>Facility Maintenance</u>	
920	Facility and equipment maintenance (FEM) C buildings/structures
921	FEM C utilities
922	FEM C custodial functions
925	FEM C boating access
926	FEM C roads/bridges
927	FEM C trails
928	FEM C fences
Visitor Services/Recreation	
<u>Information/Education Programs</u>	
145	Technical bulletin
<u>Operations</u>	
311	Boundary signs
312	Informational signs
320	Outreach and education C attending or developing educational or informational materials or events for the public
327	Becoming an Outdoor Woman C enhancement
331	Wings Over Florida
339	Range safety operations

- 341 Public use administration (hunting)
- 342 Public use administration (non-hunting)
- 350 Customer service support C disseminating written or verbal information or assistance to the public
- 700 STUDIES
- 740 EVALUATIONS AND ASSESSMENTS

Law Enforcement

FWC Activity Code Numeric Listing

- 100 ADMINISTRATION C administrative tasks, including preparation of forms, word processing, photocopying, filing, and other clerical/secretarial duties.
- 101 Project inspection C field inspections of projects.
- 103 Meetings C includes workshops, conferences, staff, and other meetings.
- 104 Budget/purchasing/accounting
- 128 New Vehicle and Equipment Purchase
- 140 REPORT WRITING/EDITING/MANUSCRIPT PREPARATION
- 141 Grant applications
- 145 Technical bulletin
- 150 PERSONNEL MANAGEMENT C recruitment, hiring, training, counseling, and supervising.
- 180 SYSTEMS ADMINISTRATION AND MANAGEMENT
- 182 Data management
- 184 Metadata development and management
- 185 GIS
- 186 Biometrics
- 187 IT
- 188 Web development
- 191 Stamp design coordination
- 194 Lake restoration
- 200 RESOURCE MANAGEMENT
- 201 Cultural resource management
- 202 Timber management
- 203 Tree and shrub planting
- 204 Resource planning
- 205 Prescribed burning
- 206 Prescribed burning C growing season (April 1 to September 30)
- 207 Prescribed burning C dormant season (October 1 to March 31)
- 208 Firebreaks
- 209 Land Management Reviews
- 210 Exotic species control
- 211 Exotic plant control (mechanical)
- 212 Exotic plant control (chemical)
- 213 Wildlife management
- 214 Listed Species management
- 215 Hydrology management
- 216 Dams, dikes, levees
- 217 Canals

218	Water level management
219	Upland restoration
221	Animal surveys
226	Human dimensions surveys
228	Inland aerial surveys
235	Vegetation and plant surveys
250	MONITORING AND ASSESSMENTS
252	Biomedical monitoring
253	Ecological monitoring
256	Habitat monitoring analysis
263	Nest box monitoring
264	Population demographics
275	Permits and authorizations
276	Commission rule development and review
277	Relocation
278	CITES tags
281	Other resource management
282	Herbaceous seeding
283	Clearings
284	Feeding/watering
285	Nest structures
286	Population control
287	Stocking enhancements/population augmentation
288	Nuisance animal complaints
289	Native vegetation management (mechanical)
290	Native vegetation management (chemical)
293	Mortality investigations
294	Program coordination and implementation C inter- and intra-agency coordination and program implementation at the section, bureau, or division level
295	Biological data collection, analysis, and reporting
296	Habitat protection technical assistance
311	Boundary signs
312	Informational signs
320	Outreach and education C attending or developing educational or informational materials or events for the public
327	Becoming an Outdoor Woman C enhancement
331	Wings Over Florida
339	Range safety operations
341	Public use administration (hunting)
342	Public use administration (non-hunting)
350	Customer service support C disseminating written or verbal information or assistance to the public
700	STUDIES
721	Geospatial analysis techniques 740 EVALUATIONS AND ASSESSMENTS
750	URTD assessment
789	Site Preparation – GCR
790	Irrigation – GCR
791	Seed Collection – Hand
792	Seed Collection – Mechanical

- 793 Herbicide Maintenance Treatment
- 910 New facility construction C buildings/structures
- 912 New construction C roads/bridges
- 913 New construction C trails
- 914 New construction C fences
- 920 Facility and equipment maintenance (FEM) C buildings/structures
- 921 FEM C utilities
- 922 FEM C custodial functions
- 923 FEM C vehicles/equipment
- 925 FEM C boating access
- 926 FEM C roads/bridges
- 927 FEM C trails
- 928 FEM C fences

Operational Planning Summary for the LWRWEA 2013-2014 Fiscal Year

Activity Title	Man Days	Salary	FuelCost	Other	Total	Units
100 Administration	40.00	\$8,463.60	\$730.00	\$20,000.00	\$29,193.60	0
101 Project inspection	5.00	\$1,057.95	\$91.25	\$0.00	\$1,149.20	0
103 Meetings	30.00	\$6,347.70	\$547.50	\$0.00	\$6,895.20	0
128 New Vehicle and Equipment Purchases	5.00	\$1,057.95	\$91.25	\$120,000.00	\$121,149.20	1
200 Resource Management	5.00	\$1,057.95	\$91.25	\$0.00	\$1,149.20	0
204 Resource planning	60.00	\$12,695.40	\$1,095.00	\$1,500.00	\$15,290.40	19
206 Prescribed burning - growing season	140.00	\$29,622.60	\$2,555.00	\$3,750.00	\$35,927.60	1000
207 Prescribed burning - dormant season	130.00	\$27,506.70	\$2,372.50	\$3,000.00	\$32,879.20	500
208 Firebreaks	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
211 Exotic plant control (mechanical)	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
212 Exotic plant control (chemical)	65.00	\$13,753.35	\$1,186.25	\$1,000.00	\$15,939.60	100
219 Upland restoration	120.00	\$25,390.80	\$2,190.00	\$20,000.00	\$47,580.80	91
221 Animal surveys	40.00	\$8,463.60	\$730.00	\$13,002.00	\$22,195.60	0
235 Vegetation and plant surveys	25.00	\$5,289.75	\$456.25	\$9,546.00	\$15,292.00	0
263 Nest box monitoring	15.00	\$3,173.85	\$273.75	\$0.00	\$3,447.60	0
282 Herbaceous seeding	25.00	\$5,289.75	\$456.25	\$10,000.00	\$15,746.00	50
288 Nuisance animal complaints	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
289 Native vegetation management (mechanical)	80.00	\$16,927.20	\$1,460.00	\$47,500.00	\$65,887.20	0
294 Program coordination and implementation	40.00	\$8,463.60	\$730.00	\$0.00	\$9,193.60	0
295 Biological data collection, analysis, and reporting	10.00	\$2,115.90	\$182.50	\$0.00	\$2,298.40	0
312 Informational signs	5.00	\$1,057.95	\$91.25	\$0.00	\$1,149.20	0
320 Outreach and education	20.00	\$4,231.80	\$365.00	\$35,500.00	\$40,096.80	0
342 Public use administration (non-hunting)	10.00	\$2,115.90	\$182.50	\$0.00	\$2,298.40	4
910 New facility construction -- buildings/structures	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
913 New construction -- trails	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
914 New construction -- fences	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
920 FEM -- buildings/structures	25.00	\$5,289.75	\$456.25	\$7,000.00	\$12,746.00	0
923 FEM -- vehicles/equipment	55.00	\$11,637.45	\$1,003.75	\$15,000.00	\$27,641.20	0
926 FEM -- roads/bridges	10.00	\$2,115.90	\$182.50	\$2,000.00	\$4,298.40	4

Activity Title	Man Days	Salary	FuelCost	Other	Total	Unit s
927 FEM -- trails	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
928 FEM -- fences	5.00	\$1,057.95	\$91.25	\$4,000.00	\$5,149.20	55
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All totals	965.00	\$204,184.35	\$17,611.25	\$312,798.00	\$534,593.60	1824